SEPTEMBER • 1961

FIREMEN

VOLUME 28, NUMBER 9, COPYRIGHT © 1961 NATIONAL FIRE PROTECTION ASSOCIATION PRINTED IN U. S. A.

Horizontal Tank Fire — *see editorial page*

TIONAL FIRE
TECTION
OCIATION

66th
year

FIRE CHIEFS' CONVENTION ISSUE!

43,000 Circulation!

Choose from Barton-American

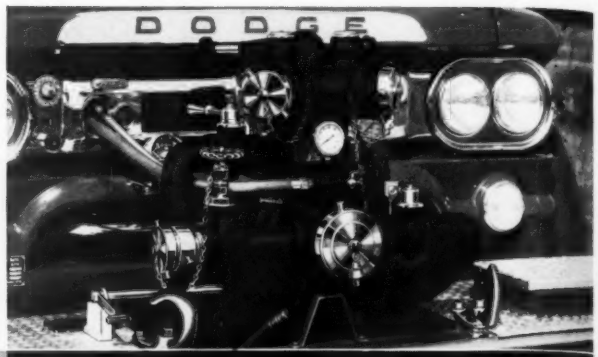
...pumps to meet all your needs...and meet them best

TYPE UA

FRONT-MOUNTED PUMPS
500-750 GPM CLASS "A" RATING

Ample pressure for fog gun operation. Fights fires "on the move".

FULL DETAILS IN BULLETIN 8330-C

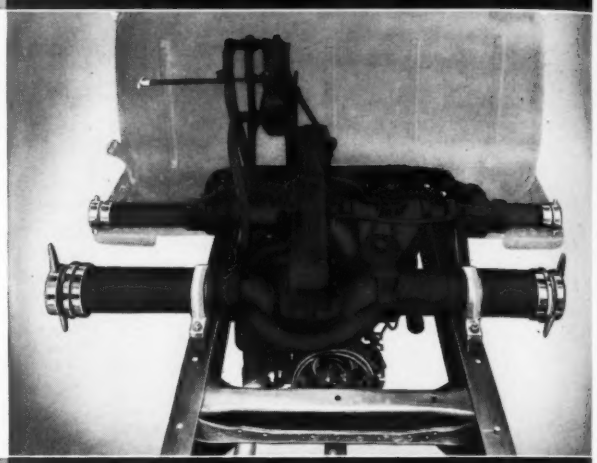


TYPE DMA

TWO-STAGE MIDSHIP PUMPS
500-750 & 1000 GPM CLASS "A" RATING

High pressure for fog gun service.
2 Independent pumps. 3 Pressure & Volume selections.

FULL DETAILS IN BULLETIN 8733



TYPE DMB

TWO, THREE & FOUR STAGE OPERATION

Pressure to 850 Lbs.

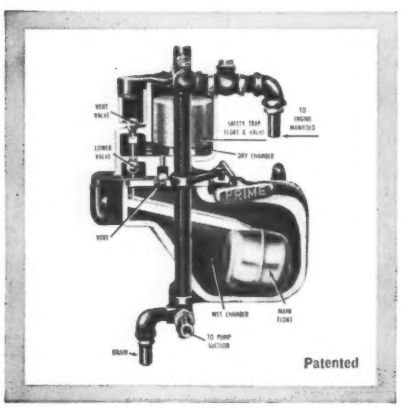
FULL DETAILS IN BULLETIN 8734

TYPE 3XD

PORTABLE PUMP
200 GPM & UP

Pressure to 90 Lbs.
Weighs only 125 Lbs.
A versatile unit for any department.

FULL DETAILS IN BULLETIN 8120



. . . and the famous Barton-American ENGINE VACUUM PRIMER

REQUIRES NO OIL, NO ADJUSTING, NO MAINTENANCE

Always operates with like-new efficiency—not affected by engine wear.
Employs a simple, trouble-proof principle.
Completely frost-proof. Always dependable.

FULL DETAILS IN BULLETIN 8733

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fire hydrants

...for special applications

flush type

Uses:
Wherever post-type hydrant cannot be used,
Airports, narrow streets, sidewalks, etc.
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2⅛" valve opening post type

Uses:
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These fire hydrants for special applications are just a part of the full line of fire hydrants produced for municipal, industrial and private fire protection systems by Mueller Co.

The design and quality of these special hydrants is exactly the same as Mueller AWWA Standard Fire Hydrants for municipal use. Compression type main valves, automatic drain valve mechanisms and "O" ring stem seals are just a few of the features. The only difference in the 2⅛" valve opening hydrants is size.

The use of these quality features in *all* Mueller fire hydrants is typical of the great attention to detail in research, design and engineering that becomes a part of every Mueller product made for the water industry.

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HERE AT LAST . .

plus being used for 8½ straight hours against a gre... the side of a cracker plant, through the "INDIRE... 300′ wide. In addition, we have received testimoni... Copies mailed upon request. Available in four size...

DISPERSING WATER

DISPERSING BENTONITE

TEST FIRE 200 x 25 FEET

Photos by U. S. Forest Service

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RESULT 10 MINUTES LATER USING CONTROLLED DRY AIR STREAM FROM 300′ DISTANT

18″ MAKING HEAVY PILED SLASH BURN

PRICES: the 18″ at $264.82; the 24″ at $347.70; the 36″ at $461.50; the 72″ price on request (may be leased)

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OF SPECIAL IMPORTANCE is the fact that the 18″ through ... are light, compact, hand-portable, self-contained (no extens... cords, generators, compressors needed). Air-moving appara... that may be quickly taken to upper floors, roofs, and opera... to ventilate or overcome inversion conditions, protect exposu... or they may be operated from the platform of aerial appara... Other uses include back firing, control prescribed burns, dis... of piled slash even under damp conditions.

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A CONFLAGRATION-FIGHTING METHOD Proven by Test and Demonstration with Federal, State and City Fire Services —

asoline refinery fire to protect 11 exposed tanks and TTACK METHOD" and disperse water 500' distant — tters supporting our claims and recommended uses. " — 24" — 36" — 72".

72" DISPERSING 20 GPM DOWN CANYON FIRE TRAIL THROUGH 10 MPH CROSS WINDS

Rodeo Fire District Photo

TWO 18" REMOVING SMOKE AT VAN NUYS

Controlled Airstreams Photo

PROTECTING EXPOSURES AT FRESNO THROUGH 15 MPH CROSS WINDS

Rodeo Fire District Photo

END OF TEST 5 MINUTES LATER NOTE SMOKE TRAVELING PAST PORCH

Controlled Airstreams Photo

KNOCKING DOWN HOT COLUMN AT FRESNO

Rodeo Fire District Photo

PROTECTING 11 TANKS & CRACKER PLANT

Los Angeles County Fire Department Photo

e 72" is capable of knocking down HOT convection columns in inutes .. replacing 20 HANDLINES — maneuvering quickly up down a street-alley-road-highway, while operating and dis-rsing water as FOG MIST or RETARDANTS, TO RESTRAIN HE ADVANCE OF WILDFIRE — Reducing and eliminating azards of conduction-convection-radiation, also, sparks-embers-rands — Protecting adjacent exposures with an AIRWALL if ater not available — Ventilating large area structures, also, nnels and subways — Plus too many advantages to list in mited space.

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Leadership

Combines superior product design and life-long service

Important Extra Value features in American LaFrance Fire Apparatus assure longer life, less maintenance and greater safety in operation.

THE AMERICAN LAFRANCE 900 Series fire apparatus represent years of experience (we are in our 127th year) in the design and production of fire fighting equipment. The 900 Series is the finest in appearance and quality of materials that competent engineers and skilled craftsmen can produce.

The 900 Series includes important features not illustrated that contribute to the excellence of these American LaFrance fire engines and aerial ladder trucks. Some of these Extra Values are:

Cab-ahead-of-engine design for maximum safety and visibility for driver and crew. 5-man seating. Four way adjustable driver's seat. Short turning radius and easy steering.

The chassis frame is a deep section pressed steel channel with all welded cross members for maximum load carrying capacity with minimum deflection.

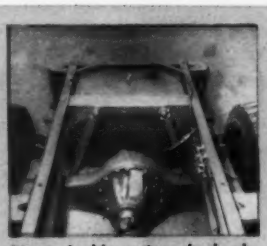
Engine cooling system is pressurized (4 p.s.i.) for efficiency and operation without loss of water or anti-freeze.

Six large enclosed compartments for weatherproof protection of equipment. Side compartments are "bolted-on" construction with sealing at all contact surfaces to prevent corrosion from salt solution so commonly used on today's highways and streets. This sealing cannot be done with "welded on" construction.

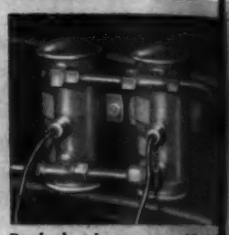
The TWINFLOW pump is built by American LaFrance and includes such features as single packing, adjustable, no special tools required; Bearium metal (high lead bronze) seal rings at the eye of each impeller; front bearing of Bearium metal, will not seize or score; impellers are in both static and dynamic balance for vibration free operation. Discharge gates are full flow (2½ inch waterway) ball type quarter turn with locking handle. The ball is hard chrome plated to eliminate corrosion and scoring. The American LaFrance discharge gates always work freely at any pressure.

Six engine sizes (215 b.h.p. to 330 b.h.p.) provide a wide range in engine power selection. In addition, the gas turbine engine (330 b.h.p.) is available.

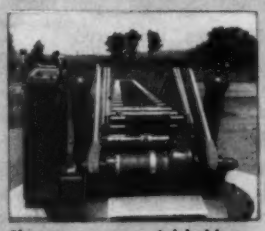
The long service life of American LaFrance fire engines is a matter of record. Several hundred American LaFrance fire engines over 40 years old are still in active service. All service requirements, both maintenance and parts, are available from American LaFrance.



Direct double acting shock absorbers at rear provide maximum safety. Prevents roll on turns.



Dual electric pumps, with [illegible] gallon fuel lines, one to mechanical [illegible] pump, prevent vapor lock [illegible] insure continuous fuel [illegible]



Clear access to aerial ladder—no tubes to climb over when ascending or descending ladder.

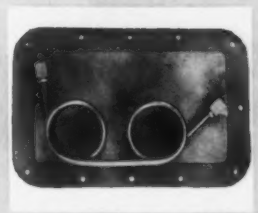
Turntable bearing rings 65 inch[es] [illegible] diameter for maximum [illegible] stability and control.

MODEL 4-85 aerial. Optional extra features shown: Federal [illegible] Q2B Siren; Federal Beacon-Ray light; 200 gallon water [illegible] booster pump; rear electric hose reel; enclosed compart[illegible]

• **See the AMERICAN LAFRANCE Fire Engines at the I.A.F.C. conferen[illegible]**

METROPOLITAN — 1250 g.p.m. Class A pumper. Also ALFCO 4 stage high pressure pump: Optional extras shown: front suction, 2½ inch; Akron deluge gun on cab roof; 110 volt outlets; Fyr-Fyter penetrator siren; rear red lights; Federal Beacon-Ray light; one extra booster reel and hose; two gated suction inlets; pressure gauges each outlet.

gallon water tank has slop-bottom, deep outlet sump, removable covers and is Zinci- treated.



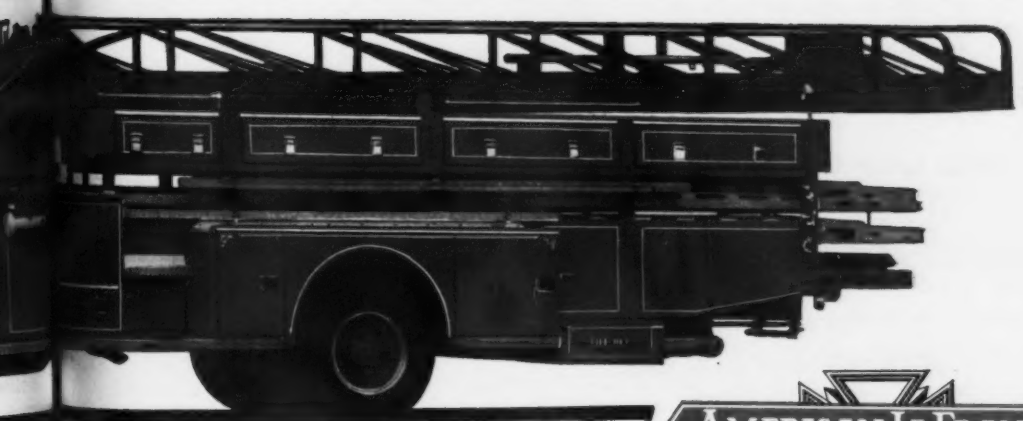
Cooling coils in pump transmission insure proper lubrication under all operating conditions.

Chassis springs have second leaf wrapped around eye as safety feature. All springs chrome manganese alloy steel.

design of turntable with piping or rubber hose. By- valve in extension circuit accessible.

All controls directional. Visual indicators automatically register man load for all operating conditions.

Turnbuckles are provided for adjustment of each cable. Nothing to disconnect.



ground ladders; wood ground ladders; 6 ft. pike pole on ladder; side tool compartment; marker lights; Fi-Tronics system on aerial ladder and control tower.

Vegas, Sept. 25-29

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THERMOID DIVISION
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Fyr-Fyter's authorized distributor organization—with representatives in each of the fifty states—can NOW furnish the most complete line of quality Municipal fire hose brands in the industry.

See Fyr-Fyter's 40-ft. display of new Fire Department products at the 1961 I.A.F.C. Show in Las Vegas.

GET

Miss Jean Moorhead, a former Miss Hollywood and entrant in the Miss Universe contest.

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INDIAN

FIRE PUMPS

"The World's Best"

NO fire fighting equipment is complete without an ample supply of **INDIAN FIRE PUMPS!** These all-purpose back-pack extinguishers have been first choice for over 30 years! Many pumps bought 25 years ago are still in service.

When you buy **INDIANS** you get the best portable fire fighters that can be made . . . a product of a company founded in 1888. **SAVE TIME . . . SAVE MONEY . . . SAVE EFFORT . . .** always use **INDIAN FIRE PUMPS!**

"Most Enthusiastic About INDIANS"

"We have a number of No. 90 solid brass **INDIAN FIRE PUMPS** on all our equipment. We prefer them to any other hand extinguisher. The men will not use anything else. We are most enthusiastic about **INDIANS.**"

George P. Lasher, *Fire Chief*

THREE GREAT MODELS TO CHOOSE FROM

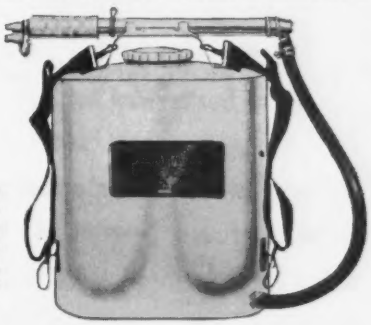
No. 90 INDIAN FIRE PUMP

The popular sliding pump type with Armco Zinc Grip steel, solid brass or chrome tanks. New shorter pump.

No. 80 MODEL

For those who prefer the lever type pump and handle. Armco Zinc Grip steel, solid brass or chrome tanks.

NEW FIBERGLASS No. 90 MODEL



Nothing else like it. Lightweight but strong and durable. Will not rust or corrode. Improved, shorter, solid brass pump. Circular on request.

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CONSIDER THE ADVANTAGES OF DIESEL-POWERED APPARATUS

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WHAT ARE THE ADVANTAGES OF THE MACK THERMODYNE® DIESEL?

1 Maximum performance at operating and pumping speeds. Develops 230 HP at 2300 rpm and 583 lb.-ft. of torque at 1600 rpm. Turbocharged for peak efficiency.

2 Minimum fuel consumption. The inherent efficiency of diesel power gives the advantage of being able to pump 35% longer on a tankful of fuel. Reduces need to refuel during long pumping assignments, eliminates danger of handling highly flammable gasoline, and also eliminates danger of carbon monoxide fumes. Diesel fuel is considerably cheaper than gasoline and contains more BTU's.

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4 Maximum dependability 4-cycle, 6-cylinder design. Cooler-running. No spark plugs to foul. No ignition systems to short out. The most dependable engine ever made by Mack—the standard of dependability.

5 Minimum maintenance. Mileages of 300,000, 400,000—even 700,000 miles in truck service—before engine overhaul means thousands of engine hours in fire service. Will not foul up during long periods of idling. Built with typical Mack strength and servicing ease. Similarity to Mack Thermodyne® gasoline engines simplifies mechanics' training—over 350 Mack service centers expedite servicing and parts supply.

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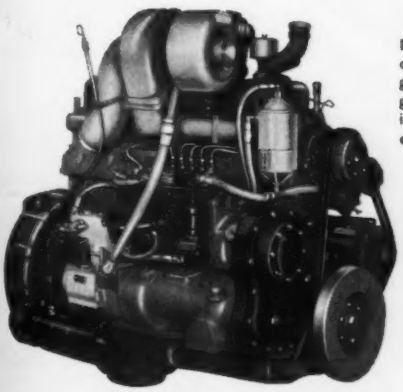
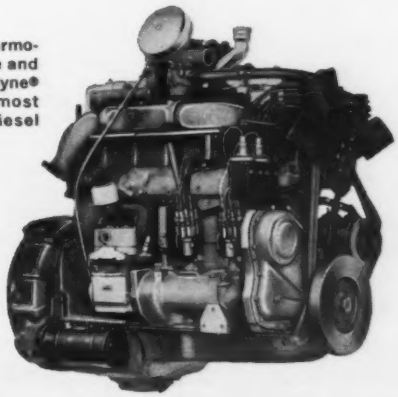


Note similarity of Mack-built Thermodyne® diesel and gas engines! Size and general appearance of Thermodyne® gasoline engine (right) are almost identical with Thermodyne® diesel engine (left).



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COMPLETE LINE OF PUMPERS . . . 500 TO 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65' TO 146' . . . COMBINATION LADDER TRUCKS

THE GREATEST ADVANCE IN FIRE HOSE DESIGN SINCE 1875

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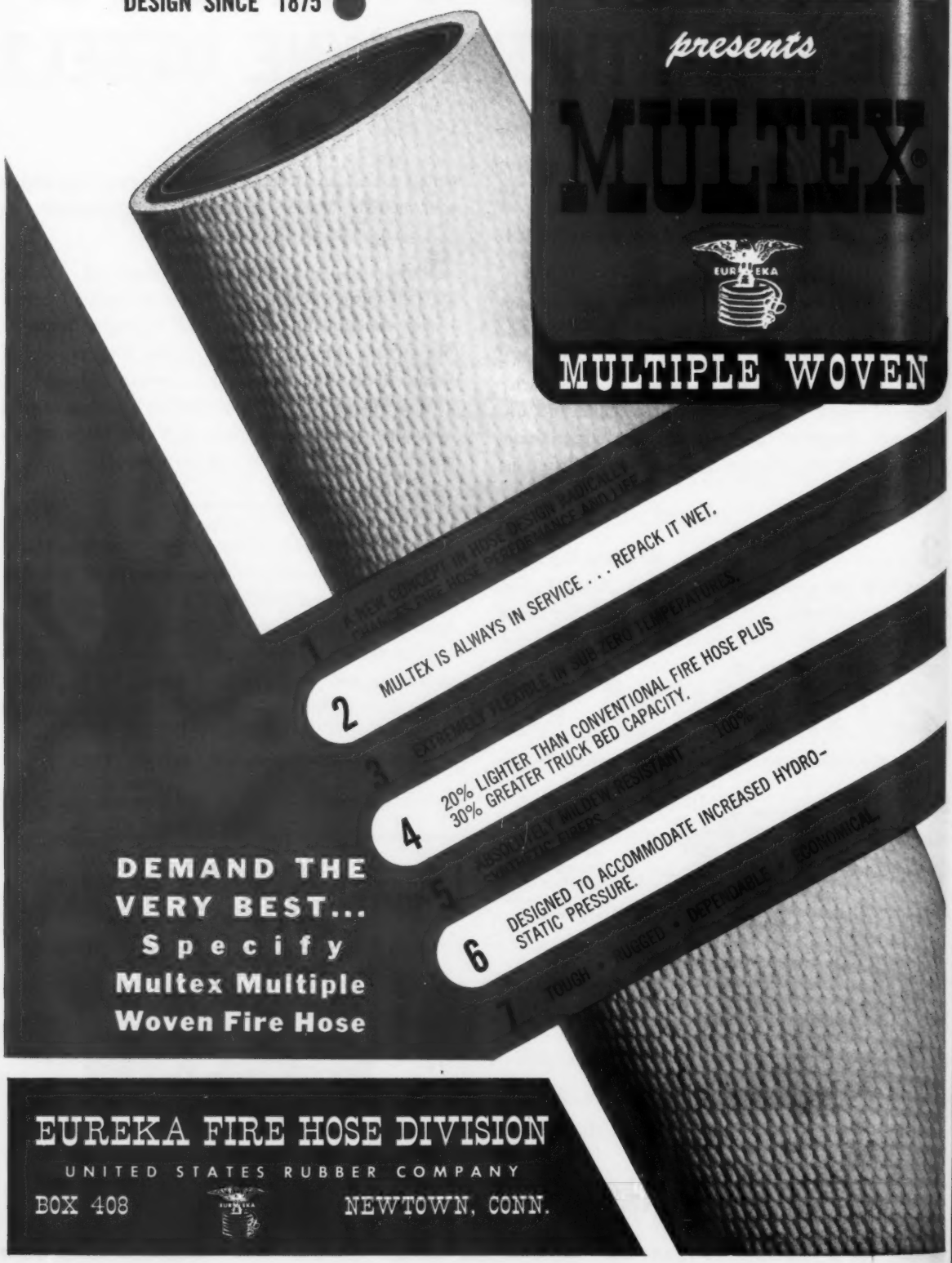
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NFPA FIREMEN

Volume 28 Number 9

A monthly magazine published for the fire service members of the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Massachusetts.

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With this issue of NFPA FIREMEN magazine we salute the thousands of fire service members who will attend the 88th Conference of the International Association of Fire Chiefs at Las Vegas, Nevada, later this month. The magazine is being circulated to the thousands of fire departments in the United States and Canada who are constantly trying to improve their methods of operation in the continual battle against fire.

The features have been selected as a sampling of the type of information that comes regularly to fire departments which have membership in the National Fire Protection Association. The article by NFPA General Manager Percy Bugbee, on page 18, indicates the rising demand by the fire service for such useful information. In the pages following you will also find articles written by members of the NFPA staff to appeal to the interests of chiefs, other fire officers and fire fighters, and to stimulate the application of new techniques or new methods of operation.

For fire departments which do not have membership in NFPA the special application blank is included on the back cover of this issue. You, as chief of your fire department, can make use of this blank to start NFPA membership for the coming year. This is the easiest way to guarantee your fire department a continual flow of the latest and best information on fire protection, fire prevention and fire control. If you haven't tried this before, do so now.

A scene from a forthcoming new motion-picture film is shown on this month's cover. Called *Fighting Tank Fires*, this 25-minute, full color film with sound was written and produced by the NFPA for the interests of paid, call and volunteer fire departments. It is expected to be available for distribution by NFPA in the latter part of this year.

As shown on the photos on pages 26–29 of this issue, fires of considerable size and intensity were created for the making of this film. Members of the Tulsa, Oklahoma, Fire Department, under the direction of Chief G. L. Sartain, battled these fires using specific techniques which other fire departments could follow in "dry run" training or actual fire ground operations. To resolve the controversial question of whether 1½-inch or 2½-inch lines should be used, both sizes of hose line are featured in the film as attack lines and as back-up lines. The narration will bring out many other fundamentals of fire department operation for these emergencies.

This motion picture is expected to be extremely useful to state and provincial firemen's training schools as well as to fire training authorities on the county and local level. Special efforts are being made to complete a print in time for the NFPA Fall Conference, scheduled to be held in Kansas City, Missouri, October 30–November 1. As soon as it is available for broad distribution, announcement will be made in NFPA FIREMEN magazine as well as in other publications of the Association. (*Cover photo by Harold E. Kuhlman, Oklahoma Inspection Bureau.*)

Coming up, as mentioned above, is the NFPA Fall Conference. It will be held in Kansas City, Missouri, October 30 to November 1, with the Hotel President serving as headquarters. A sponsoring committee, headed by Francis "Brick" Wornall, former fire director of Kansas City, and L. S. Anderson, Branch Supervisor of the Missouri Inspection Bureau, is now taking care of local arrangements and promotion.

Since they first began, these Fall Conferences have been among the most popular and important functions of the Association. They are particularly useful to members of the fire service because they focus attention on fire protection problems of immediate importance to the area where the Conference is being held. The informal sessions allow plenty of opportunity for questions and lively discussion "from the floor."

So, we issue an invitation to fire department personnel in states surrounding Missouri to attend this important meeting. Several technical committees will be meeting in conjunction with the Conference and the Fire Marshals Association of North America will hold its midyear conference at the same time and place.

WARREN Y. KIMBALL, Managing Editor; PAUL R. LYONS, Editor; HENRY S. GERE, Advertising Manager; ROWENA D. DORES, Editorial Assistant; SHIRLEY TOBEY, Fire Service Department; VIRGINIA STILES, Advertising Department.

Registration, all sessions and manufacturers' exhibits will be in the new Convention Center.

LAS VEGAS— Scene of the 88th IAFC Conference

FROM Sunday, September 24 to Thursday, September 28, fire chiefs from all over North America will meet in Las Vegas, Nevada, for the 88th Conference of the International Association of Fire Chiefs. Record attendance is expected, not only because Las Vegas is renowned as a convention city but because the Pacific Coast Inter-Mountain Association of Fire Chiefs will hold its annual meeting at the same place on Monday, September 25. On that afternoon both associations will hold a special joint memorial service.

Host for the week's activities will be Fire Chief C. D. Williams who commands the 108-man fire department in the city of approximately 65,000 population. Chief Williams will be introduced to the conference on Tuesday morning and, in turn, will introduce special guests.

Chief C. D. Williams, Las Vegas, Nevada, Fire Department

Here is a general summary of the program planned for the week:

All day Sunday, September 24, will be given to registration of the expected 2,000 plus members and guests. Registration and all sessions will be at the six-million-dollar Las Vegas Convention Center. Headquarters will be at the Sahara Hotel.

Monday morning and afternoon will feature the meeting of the Pacific Coast Inter-Mountain Association and the joint memorial service. The fire apparatus and equipment exhibits will be open at 9:00 A.M. at the convention center and will remain on display for the rest of the week. Nearly 100 manufacturers and distributors will have their representatives in attendance at the convention booths throughout the week.

Opening session of the Conference at 10:00 A.M. Tuesday morning, will feature preliminary ceremonies, welcoming address, introduction of guests and keynote speaker J. Roger Deas, of the American Can Company. Tuesday afternoon will include the report by IAFC President, Chief William J. Taylor, plus illustrated

Visit members of the
NFPA STAFF
at
Booth Number 46
in the
Convention Center
during the Conference

Headquarters of the Las Vegas Fire Department.

Fire Station No. 3 is typical of the other new stations.

talks covering last year's earthquake in Chile, tidal waves and floods and an accident involving radioactive materials in Idaho Falls. Tuesday evening will feature the annual "Get Acquainted Party."

Wednesday morning will include committee reports plus a talk by Frank Burton Ellis, recently appointed director of OCDM in Washington, D. C.

Thursday morning will include reports of chairmen of special "brainstorming" sessions, a talk by Dr. Leonard C. Silvern, of Hughes Aircraft Company, and other items. A business meeting on Thursday afternoon will be followed by a closing banquet in the evening.

During these IAFC conferences a number of visiting fire chiefs and guests like to drop in on the headquarters and stations of the host fire department and surrounding departments. Accordingly, here is a run-down on three fire organizations in and near Las Vegas.

The city covers about 24 square miles and has undergone rapid development in the past few years. The Las Vegas Fire Department, under the command of Chief Williams, consists of seven engine companies and a ladder company housed in five stations, most of which have been built or enlarged within the last ten years. There are one 750, four 1,000 and two 1,250 Seagrave pumpers, a 65-foot Seagrave aerial ladder truck, plus three tank trucks with 500 gpm pumps, and a rescue truck. Fire department members work an average of 70 hours per week but it is anticipated that the work week will drop to 67 hours in about a year. Of the original personnel who were in the department when it was organized in 1942, only Chief Williams and four others remain, and two of them will retire shortly.

Headquarters of the Las Vegas Fire Department is near the junction of Second Street and Mesquite Avenue. Two pumpers, the aerial ladder, a tank truck and the rescue truck operate from this station. Another station, covering the high value district, houses Engine No. 4 with two pumpers at the junction of Utah Avenue and Industrial Road. The other three stations are evenly spaced around the city. The department uses the tank trucks primarily for brush fires on the city's perimeter. It also furnishes mutual aid to the Las Vegas Strip area and to nearby Nellis Air Force Base.

Also operating on the outskirts of Las Vegas is the Clark County Fire Department, commanded by Fire Chief W. H. Trelease. This department was organized in 1954 to protect the Paradise and Winchester Townships of the county which include more than one hundred million dollars worth of property in the Las Vegas Strip, such as 40 motels, 33 apartment buildings, restaurants, bars, gasoline stations, warehouses and dwellings.

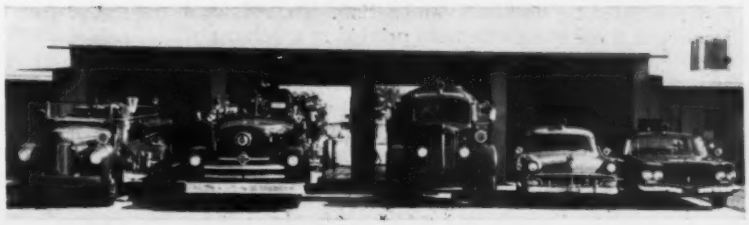
Chief Trelease mentions that his department also responds to calls in the county as far as thirty miles outside the city. At present, the department has four stations, one 750 and one 1,000 gpm pumper, two 1,000 gallon tankers, one 500 and one 750 gpm combination tanker-pumper, an 85-foot aerial ladder, a crash truck, a jeep, a rescue unit and four sedans. The 63-man fire department also protects McCarran Airport and a new station is scheduled to be completed at this site this month. Another crash truck and a 1,250 gpm pumper will be put in service here to supplement the old crash truck, the 1,000 gallon tanker and the jeep.

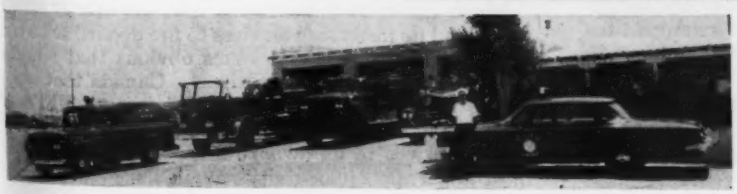
Chief Trelease expects three more stations to be built in the near future to serve the rapidly growing industry and population.

Just to the northeast of Las Vegas is the fire department of North Las Vegas, a city which has jumped from 4,000 to 20,000 population in the last ten years. This small but active fire department for two consecutive years has taken first place among Nevada entries in the NFPA Fire Prevention Contest.

Operating on a two-platoon system, 72-hour week, the department has a 500 and a 1,000 gpm pumper, a 2,000 gallon tanker with 500 and 200 gpm pumps, a rescue unit and chiefs' cars.

At right is the apparatus and headquarters of the North Las Vegas Fire Department.





At left is the apparatus and headquarters of the Clark County Fire Department. Chief Trelease is in the foreground.

How NFPA Serves Fire Departments

by Percy Bugbee, General Manager, National Fire Protection Association

THE present membership of the National Fire Protection Association is approximately 18,700. This is the highest total membership in the 65-year history of our Association. NFPA has only two classes of membership: organization membership — limited to national and regional associations interested in fire safety, and associate membership — open to any organization, company or individual.

An analysis of present membership indicates the very broad base of our international Association. The 200-plus organization members include many governmental departments such as the Departments of Agriculture and Interior, the Army, Navy, Air Force, Veterans Administration, and Federal Fire Council. Organization membership also includes such important groups as the American National Red Cross, the National Association of Manufacturers, the American Medical Association, the International Association of Fire Chiefs, and the American Institute of Architects. Also supporting NFPA as organization members are 86 national trade associations and 74 national and regional insurance associations and bureaus.

Associate membership includes some 5,000 fire departments and other public officials, 7,000 industries, 3,500 insurance companies, engineers and inspectors, and many architects, colleges, public libraries, technical specialists and other individuals from all walks of life who are interested in one or more phases of fire safety. We now have 2,000 members from 56 countries other than the United States.

A basic activity of NFPA is the preparation of technical standards covering the broad field of fire protection and prevention. Our National Fire Codes, published annually in the fall of the year, now include seven volumes totaling more than 5,500 pages. Perhaps a better concept of the activity in this field can be gained from the fact that during our recent annual meeting in Detroit in May more than 60 standards were presented for discussion and action. The Advance Reports of these standards were printed in a volume of 950 pages. The NFPA standards adopted at Detroit that are of particular interest to fire departments included new material on Organization of a Fire Department, Functions and Operation of a Fire Department Company, Motor Fire Apparatus, Fire Department Operations in Protected Properties, the Building Exits Code, a Guide for Smoke and Heat Venting, a Guide for Aircraft Rescue and Fire Fighting Techniques for Fire Departments Using Conventional Fire Apparatus and Equipment, and a System for the Identification of the Fire Hazards of Materials.

More and more fire departments are utilizing effectively in local codes these and many other important standards of NFPA. It is worth noting that more and more fire chiefs, fire marshals and fire prevention officers of fire departments are actively participating in the standard-making function of NFPA and contributing their valuable information and experience to this important part of our operation.

Another measure of the growth of NFPA today is in the demand for its publications. During the past year more than 50,000 requests for publications were received and more than ten million publications were distributed from our headquarters. Fire departments year by year order more NFPA publications for public education and for other uses.

Two departments of NFPA of particular interest to paid, call and volunteer fire departments are our Fire Service Department and our Fire Record Department. The Fire Service Department not only publishes FIREMEN magazine but develops books, standards and other material of practical interest and value to fire departments everywhere. The books in our Fire Ground Library are in great demand and are the basis of training programs in many fire departments. Our Fire Service Department answers thousands of inquiries from fire departments and is always eager to be helpful to any member of the fire service.

Our Fire Record Department develops information on all important fires, all large loss fires, all major loss of life fires, and issues many special studies of fires by occupancy. The material developed by this department is being used more and more by fire departments.

The annual Fire Prevention Contest for year-round excellence in fire prevention work has grown to great proportions in recent years. More than 1,700 entrants participated in 1960 and we anticipate an even greater number of entrants in 1961. This contest gives fire departments throughout the United States and Canada an opportunity to compete for awards recognizing year-round effort in the field of fire safety education. The terrific growth of this contest over the years is a good illustration of the growth of interest in fire safety education by our fire departments and by the general public. The NFPA Public Relations Department sends out information about all aspects of fire safety not only to newspapers, radio and television, but also to magazines and industrial house organs. Sparky, the firehouse Dalmatian dog, has become a national symbol of fire safety to the children of America, and hundreds of Sparky Fire Departments in the United States and Canada are sponsored by fire departments.

These examples indicate the wide growth of NFPA today and its increasing services to fire departments and to the general public. It seems obvious that any fire department in the United States or Canada that is not taking advantage of the many services of NFPA to enlarge its own sphere of operations and to render greater service to its own public is missing one of the most important opportunities available.

Advancing Lines With Aerial Ladders

by Warren Y. Kimball, Managing Editor, FIREMEN Magazine, Manager, Fire Service Department

The old-fashioned way of advancing a 2½-inch line over the aerial ladder sometimes required six men to carry hose manually up the ladder.

The Fort Wayne, Indiana, Fire Department, headed by Chief Howard Blanton, has developed and made operational a series of evolutions for utilization of aerial ladders in advancing lines and equipment. Chief Instructor Ralph L. Ellenwood, member of the NFPA Committee on Fire Service Training, demonstrated these evolutions at the Fort Wayne training center.

WHAT would modern business or industry management think of an operation which employed 6 or 8 men worth $50,000 or more on the pay roll to drag tools laboriously up a long ladder while a $50,000 power hoist owned by the firm stood idle? Obviously, in modern competitive business such an operation would be completely forbidden because of its wastefulness.

However, this is precisely what many fire departments have been doing with their aerial ladders and manpower. Too often, fire departments insist on owning one or more aerial ladders, yet, when the truck is delivered, it may not be used efficiently or economically.

Fire fighters traditionally think of an aerial ladder as a device to be climbed up or down, with occasional auxiliary use as a water tower. The fact that this apparatus is equipped with a hydraulically operated hoisting mechanism powered by a 200-plus horsepower engine seems to be overlooked.

By way of example, let's say that a 2½-inch line of hose must be taken over the aerial. Frequently you will see six or more men struggle to "carry" (but literally drag) the line up the ladder. When they get to the point of operation, they may be almost too exhausted to advance the line and fight the fire. The fact that the ladder could have been used to take the line to the desired point quickly and easily is overlooked.

Fire fighters have dragged lines up ladders for far more than 100 years, first over manually-raised ladders, then over spring-raised aerial ladders, and for the past quarter-century, over power-operated ladders. Is it not time to develop regular fire department evolutions to take greater advantage of the power hoists on modern aerial ladders?

It must be appreciated that the power hoist on an aerial ladder is designed primarily to hoist and position the ladder itself. It is not a crane hoist designed to lift heavy loads in addition to the ladder. Any use of the ladder must be within the safe load limits specified by the manufacturer.

However, NFPA Standard No. 19 specifies that an aerial must be able to lift 200 pounds in addition to the weight of the ladder and attached equipment. This provision is required to handle the load imposed by a ladder pipe and accompanying 3-inch supply hose.

Tests show that this capability is more than adequate to handle the majority of loads imposed by normal fire fighting tactics in advancing 2½-inch hose and minor equipment. In fact, with the methods suggested below, ladder loads will be reduced considerably compared with the live loads imposed when a number of men are dragging lines up a ladder. It is not unusual in the last-named evolution to have loads of 1,200 to 1,500 pounds moving on the ladder once it has been elevated into the desired operating position.

Working in cooperation with the NFPA Fire Service Department, Chief Ralph L. Ellenwood, Training Officer of the Fort Wayne, Indiana, Fire Department and a member of the NFPA Committee on Fire Service Training, has suggested the following evolutions for hoisting and advancing lines by means of power-operated aerial ladders:

A. Elevating a 2½-inch line with nozzle attached by aerial ladder to advance line into window or on a roof.

B. Elevating a 2½-inch line with gated wye and donut rolls of 1½-inch hose to desired point of operation.

C. Elevating a 2½-inch line with nozzle attached for operation from aerial ladder as an improvised ladder pipe.

Other evolutions can be developed locally.

Obviously, any such use of an aerial ladder depends upon a decision as to the tactical requirements for the ladder at a particular fire. Use of the ladder for rescue may take precedence over any other use. Or the ladder may be used for access for ventilation. In many cases, more than one aerial ladder may be employed at a fire to perform a variety of services.

Advancing 2½-Inch Line with Aerial

The purpose of this evolution is to elevate and advance a 2½-inch line with nozzle attached to any point within reach of an aerial ladder properly positioned and stabilized. Not over three men are needed on the ladder at any time. In most cases two men assisted by the ladder operator and pump operator can perform this evolution. Here is the sequence:

1. Ladder company spots and stabilizes truck in position to raise aerial to desired point.

2. Engine company drops skid load of 150 feet of 2½-inch line, with nozzle attached, beside aerial. A hose clamp is attached to the line. Pumper goes to a hydrant to hook up.

3. Pipeman goes to end of retracted aerial with rope hose tool. Second man hands him end of line with nozzle.

4. Line is tied to top rung with nozzle hanging over rung toward ground. If the line is going in a window, enough line can hang over the end of the ladder to get the pipe inside when the window is reached. If the line is going on the roof, a full 50-foot section with nozzle can be taken to the roof. The operational steps are the same as going into a window. With a 50-foot section hung over the top rung, use a hose rope or hose strap to secure the nozzle to the top rung, thus doubling the 50-foot section.

5. Hose is laid on ladder with slack on ground at base of ladder.

6. Pipeman gets off ladder, which is elevated and rotated.

7. Ladder is extended as slack line is fed until nozzle reaches objective. For roof work the ladder is elevated and extended to bring the 25 feet of doubled hose over the roof. The ladder is then retracted, placing the hose on the roof. When the ladder is retracted and properly placed, the hoseman and officer climb the ladder and stretch out the 50-foot section. Height of roof and length of ladder will have some bearing on how much line can overhang.

8. Ladder pawls are set and pipeman and officer climb ladder and remove hose rope holding nozzle. If required, one hoseman remains halfway up the ladder to help advance slack line until enough hose is obtained.

9. When officer calls for water, ladder operator removes hose clamp and line is charged to nozzle.

Gated wye on end of 150-foot line hangs over tip of ladder. Donut roll is held by rope hose tool. (Evolution B)

Advancing 2½-Inch Line with Gated Wye Attached

This evolution advances a 2½-inch line with a gated wye with 1½-inch outlets rather than a 2½-inch nozzle. In addition to the 2½-inch hose, the ladder can elevate 1½-inch donut rolls when fires do not require a big line but one or more 1½-inch lines are needed. The evolution is similar to A with the following exceptions:

1. The engine company attaches the gated wye (or a water thief) to the end of the normal 150-foot skid load. The line is secured to the top rung of the ladder with the wye hanging down.

2. The 1½-inch donut rolls may be attached to the ladder in several ways. If the rolls have been formed with a loop of hose for carrying, the loop may be placed over the end of each ladder beam to elevate the two donut rolls. However, a preferred method is to run a rope hose tool through each donut roll to secure the roll and then place the hook of each rope tool over the top rung.

3. Unless the donut rolls have 1½-inch nozzles attached, the nozzles will have to be carried by the fire fighters.

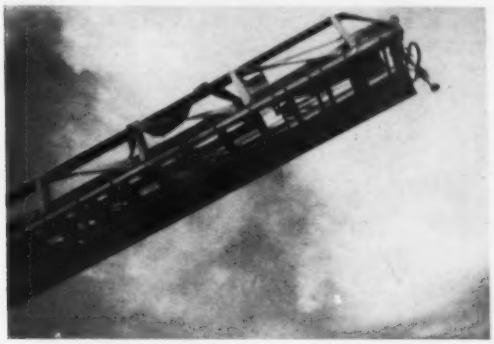
4. The ladder operator may elevate the ladder one or two rungs past the desired objective (window or roof) to make it easier to get donut rolls into the window or on the roof without lifting. (Donut rolls carried in a small box or canvas sling are easily handled.)

5. When the first hoseman reaches the top of the ladder after the hose has been elevated, he removes the donut rolls from the top of the ladder and then pulls the gated wye into the window. It is unnecessary to remove the rope hose tool at the top of the ladder except to advance the big line. In any case, the rope tool should not be released unless the line is otherwise secured. In most cases, a second rope tool will be attached halfway down the ladder before the line is charged. Fire fighters may also use elevators or stairways to advance up into the building and then call for the portable standpipe from a window near the burning area.

6. Fire fighters attach the 1½-inch hose to the wye and the officer calls for water. The hose clamp at the base of the ladder is removed and the line charged. If the fire can be reached with the 1½-inch hose without advancing the big line, the wye is left secured to the top of the ladder. The line may be charged to the wye as soon as the ladder is in position, assuming that the gate valves are closed.

Fire fighter at the top of aerial ladder easily directs stream from 2½-inch line elevated into position by the hydraulic hoist of the aerial ladder.

Photo showing the amount of slack line needed to provide a bow in the hose to permit easy manipulation of stream. Tie-in is made at ninth rung below top of aerial ladder.



This shows the ladder carrying 2½-inch line and pipe being elevated into position for operation.

Elevating 2½-Inch Line with Nozzle Attached for Water Tower Service

This evolution is one of the most useful that can be performed with a power-operated aerial ladder. Quite frequently it is desirable to operate a charged line from an aerial ladder. While ladder pipes are standard equipment for this service where heavy streams are needed, on many occasions a good stream from a single 2½-inch line is preferable.

Ladder pipes are relatively slow to get into operation, and require flows of 500 gpm or more. Two or three relatively short 2½-inch supply lines are needed. Three- or 3½-inch hose required on the ladder must be attached to the ladder pipe and a siamese must be connected.

On the other hand, a nozzle at the end of a single 2½-inch line can be supplied by a pumper up to 1,000 feet away at conventional pump pressures. The stream can be placed in service in seconds and can be readily controlled by one man behind the nozzle. A flow of 200 to 300 gpm is adequate for many situations. This operation may be preferred where hydrants are remote and water supplies are limited. The evolution is performed as follows:

1. The aerial ladder truck is positioned and stabilized for operation with the top unsupported. (Manufacturer's recommendations for safe use of ladder should be followed.)

2. An engine company drops a skid load of 2½-inch hose. The nozzle is attached to the top rung of the bedded ladder as in Evolution A. Hose is laid on the ladder. Pump proceeds to hydrant to hook up after a hose clamp has been attached to the line.

3. The pipeman who secures the nozzle over the top rung moves back to the 9th rung from the top, pulls up approximately 1½ feet of slack hose, then attaches a hose rope tool at this point. He then lays the slack hose that is lying between the 9th rung and the nozzle over the side of the ladder.

4. As the ladder is elevated and extended to the desired position for operation of the stream, hose from the skid load is fed on to the ladder.

5. After ladder pawls have been set and the ladder secured, the hose clamp is released. When the line is charged, the 1½ feet of slack in the hose will form a bow between the 9th rung and the top of the ladder.

6. As soon as the line is charged, the pipeman climbs the ladder with a safety belt, opens the nozzle, then moves down inside the bow and secures his safety belt. By manipulating the bow in the hose, the stream can be operated in any desired direction horizontally or vertically within the plane of the ladder.

7. The engine company officer climbs to the top of the bed ladder section to direct and back up the man at the pipe. The pipeman is below the nozzle and may be below much of the heat and smoke.

8. When the fire is knocked down, the line can be extended into the building from the top of the ladder.

Let's consider flows and pressures required for this operation. Assuming that a 1⅛-inch tip is used, the flow will be between 250 and 300 gpm, depending upon nozzle pressure. Pressure loss in the 2½-inch hose will be between 15 to 20 pounds per 100 feet. (There will be no 3-inch lead hose or pressure loss in the ladder pipe to consider.) Loss due to elevation of the nozzle will be a factor but is not critical. Our suggestion would be that for elevation up to 50 feet, 20 pounds be added, and for elevations above that (to the maximum extension permitted for water tower operation) 30 pounds be added.

Two aerial ladders were used at this recent fire at Fort Wayne to advance 2½-inch hose. A line was first set up as an improvised ladder pipe and then was changed to a standpipe supplying two 1½-inch lines. (*Photo by News-Sentinel, Fort Wayne, Indiana*)

The post-crash fire damage to the DC-8 which crashed at Denver, July 11, 1961 shows that kerosene turbine fuels can cause severe damage and result in loss of life under unfavorable conditions. Fire severity in this case was influenced by release of fuel in large quantities following tire blowout, the left wing striking the ground, and the subsequent impact of the aircraft with a parked truck and the raised portion of a new runway under construction. *(Wide World Photo)*

"Kerosene" vs. "Avgas" vs. "JP-4"

— How do they compare?

by George H. Tryon
NFPA Technical Secretary

IN SEPTEMBER, last year, an Electra crashed at LaGuardia Airport. Seventy-two passengers and four crew members escaped without serious injury.

In Denver, this past July, a DC-8 crashed with 122 persons aboard. Sixteen of the passengers died in the flaming wreckage.

Both aircraft were fueled with "kerosene."

Because of such accidents, considerable interest has developed as to the crash fire significance of the use of "kerosene" in modern turbine-powered aircraft.

At the NFPA Annual Meeting in Detroit last May, M. G. Beard, Assistant Vice President for Safety for American Airlines, gave a detailed evaluation of the LaGuardia accident. His paper subsequently was published by the NFPA as Aviation Bulletin No. 272 ($1.50 a copy). He also reported on studies on the transport aircraft fire record, comparing accidents where these planes were fueled with Avgas (aviation gasoline) as opposed to those fueled with what is known technically as "Type A" turbine fuels (kerosene). He could not make a study of the aircraft accident fire record where "Type B" turbine fuels (JP-4 and equivalent blends of gasoline and kerosene) were used since the number of such incidents for commercial transports is practically non-existent. This type of fuel is not used in commercial aircraft to any great extent (except in Canada) and there is not available a sufficient record of military type transports fueled with JP-4 to make any valid comparisons.

Mr. Beard reported that his study included 103 accidents. Sixty-one (59 per cent) of the accidents involved aircraft fueled with Avgas and 42 (41 per cent) were fueled with kerosene. Of the 61 accidents involving transports fueled with gasoline, 44.3 per cent resulted in fires and of the 42 transports fueled with kerosene, 26.2 per cent resulted in fires. In his analysis, he next subdivided the 103 accidents into those which were fatal (39) as opposed to those which were non-fatal (64). Of the 24 *fatal* accidents involving aircraft fueled with Avgas, 20 resulted in fires. Of the 15 fatal accidents involving aircraft fueled with kerosene, 9 resulted in fires. Of the 37 *non-fatal* accidents involving aircraft fueled with Avgas, 6 resulted in fires. Of the non-fatal accidents involving aircraft fueled with kerosene, 3 resulted in fires.

These percentages and figures show a substantial crash fire safety factor in favor of kerosene as compared with Avgas.

Relative Ease of Ignition of the Fuels

To analyze the reasons why this experience is valid, we should look at the fire hazard properties of these fuels. First, we could evaluate the susceptibility or ease-of-ignition of these fuels. This would involve consideration of the flash point of the fuels, their flammability limits, their vapor pressure, their autoignition temperature, their distillation range and their electrostatic susceptibility.

Flash Point Data

The flash point of standard grades of Avgas is approximately minus 50 degrees Fahrenheit at sea level using the "Tag" closed-cup method of testing. The kerosene grade of turbine fuel (called "Type A" when

used in commercial aircraft) has a flash point in the range of plus 95 degrees F to plus 145 degrees F (closed-cup) at sea level. The JP-4 type of turbine fuel (now used primarily by the military but tabbed "Type B" turbine fuel when used in commercial aircraft) has a flash point in the range of from minus 10 degrees F to plus 30 degrees F (closed-cup).

From this information, it may be observed that Avgas and Type B turbine fuel at normal temperatures and pressures will give off vapors which are capable of forming ignitible mixtures with the air near the surface of the liquid or within the vessel in which it is stored. The kerosene grades of turbine fuel will not form ignitible mixtures at normal temperatures and pressures.

Flammability Limits

Now let's consider the flammability limits.

Actually, there is relatively little significance in the variations between the lower and upper flammability limits of the three hydrocarbons under consideration. The generally accepted flammability range for Avgas is 1.4 per cent to 7.6 per cent; the average figures for kerosene grades of turbine fuel are 0.6 per cent to 4.9 per cent while the average figures for the JP-4 type of turbine fuels are 0.8 per cent to 5.6 per cent. There is only two percentage points variation in the flammability ranges between the least volatile fuel (the kerosene grade) and the most volatile fuel (Avgas).

More significant is the temperature range during which it might be possible to have such flammable vapor-air mixtures. At sea level in a storage tank, this temperature for Avgas would be from about minus 50 degrees F to plus 30 degrees F. For the kerosene grade of turbine fuels, it would be from plus 95 degrees F to plus 165 degrees F. For the JP-4 type of fuel, the range would be from about minus 10 degrees F to about plus 100 degrees F. These figures show that the JP-4 type of fuel represents the most serious practical hazard under normal temperature conditions.

In speaking, however, of these flammability limits for these fuels, we are speaking only of what we might call "stable" conditions. An entirely different situation develops, much to our disadvantage, under aircraft crash impact conditions where "fuel mists" are created following tank failures. In this "mist" condition, almost all these fuels are readily ignitible. Unfortunately, in many aircraft accidents, these "mists" result from the deceleration effects especially when a major failure of the wing structure releases large quantities of fuel in a "mist" form.

Vapor Pressure

The third consideration, as outlined above, is vapor pressure. This is the pressure of the vapor at a temperature at which the vapor and liquid phases of the substance are in equilibrium in a closed container. The most usual method of measuring vapor pressures of hydrocarbons is by the Reid method where the pressures are measured at 100 degrees F.

The Reid vapor pressure of Avgas ranges from 5.5 to 7.0 lb./sq. in. absolute. For the kerosene grades of turbine fuel, the Reid vapor pressure is about 0.1 lb./sq. in. absolute. For the JP-4 type of turbine fuels, the range is between 2.0 and 3.0 lb./sq. in. absolute.

Avgas gives off flammable vapors in ignitible amounts at normal temperatures and pressures, but, when these vapors are confined, the vapor-air mixture over the liquid surface most frequently is too rich to be ignited by sparks (being above the upper flammability limit). Kerosene grades of turbine fuels, on the other hand, do not give off flammable vapors in ignitible amounts unless the fuel temperature is above 95 degrees F. This would not be anticipated except in conditions where an aircraft may sit for many hours under tropical conditions. With the JP-4 type of turbine fuel, due to the relatively low vapor pressure as compared to Avgas, the vapor air mixture above the liquid surface under normal temperature and pressure conditions most frequently will be within the flammability range. This means that ignition of the JP-4 type of turbine fuels, either within or exterior to a tank, may cause violent combustion within the confined space if flame enters.

Autoignition Temperature

Our fourth consideration is autoignition temperature. This is the minimum temperature of a substance re-

In this LaGuardia Airport crash involving a kerosene-fueled Electra on September 14, 1960, all 76 occupants were able to evacuate without serious fire injuries. The unique conditions surrounding the accident does not make it a good one to prove whatever difference there may be between kerosene, JP-4 and Avgas with respect to crash fire survivability. The fire which did occur was, however, readily controlled by the airport fire department. *(Photo above is enlarged from photo below.)*

quired to initiate or cause self-sustained combustion independently of any sparks or other means of ignition.

The test conditions under which autoignition temperatures are measured vary. Most of the figures available are derived from reproducible laboratory test procedures, whereas, in actual field conditions, these temperatures may be higher. Under one set of laboratory test conditions, Avgas has an ignition temperature of approximately 840 degrees F. Kerosene turbine fuel, using the same test method, has an autoignition temperature of approximately 475 degrees F. The JP-4 type of fuel has an autoignition temperature of 480 degrees F. It can be seen from this data that both the turbine fuels have ignition temperatures considerably lower than those of Avgas. They are, in fact, among the lowest found among common hydrocarbons.

Distillation Range

The distillation range of the various fuels is a fifth factor. We are talking here about the initial and the end boiling points of the fuels. For Avgas, the initial boiling point is approximately 110 degrees F and the end boiling point is about 325 degrees F. Kerosene, on the other hand, has an initial boiling point of 325 degrees F and an end boiling point of 450 degrees F. JP-4 is more like Avgas with an initial boiling point of 135 degrees F and an end boiling point of 485 degrees F.

This data, along with the flash point and vapor pressure criteria, indicates the relative volatility of the fuels; the initial and end boiling points show the *overall* volatility of the fuel through its entire distillation range while the flash point and vapor pressure measure the *initial* tendency of the fuel to vaporize. Kerosene has a more limited distillation range than does Avgas or the Type B turbine fuels.

Electrostatic Susceptibility

The final consideration of the susceptibility to ignition of these fuels is the degree to which a static charge may be acquired and built-up. This is difficult to measure as it depends on many factors: the amount and type of impurities, the linear velocity of the fuel in movement, the type and condition of the charge separating surfaces, and the presence of extraneous materials (such as water, air, sludge, reagents, etc.). It is clear, however, that the turbine fuels by their very nature retain more impurities than does Avgas and thus both the kerosene grade and the JP-4 grade are more prone to acquire static charges than is Avgas.

Severity After Ignition

Now that we have considered the basic susceptibility or ease-of-ignition of the three basic types of aviation fuels, let's think about the severity after ignition.

This can be evaluated basically from two points of view, heat of combustion and rate of flame spread.

There is actually very little difference in the heat of combustion between the three types of aviation fuels. The kerosene grades of turbine fuels have a heat of combustion of approximately 18,600 Btu's/lb., Type B about 18,700 Btu's/lb. and Avgas is normally quoted as being around 19,000 Btu's/lb.

The more important factor is the rate of flame spread. This is quite difficult to measure but where there are quiescent pools of spilled fuel, there is a marked difference in the rate of flame spread over pools of Type A (kerosene) grades of turbine fuel as compared with either of the other two types.

Under these conditions, a direct relationship exists between the rate of flame spread and the vapor pressures; for instance, Avgas and JP-4 type turbine fuel

Fuel	Aviation Gasoline (standard grades)	Kerosene	JP-4
Flash Point (closed-cup test) in Degrees F.	minus 50 approx.	plus 95 to 145	minus 10 to plus 30
Flammability Limits (Per cent by volume)	1.4 to 7.6	0.6 to 4.9	0.8 to 5.6
Critical Temperatures Degrees F.	minus 50 to plus 30	plus 95 to 165	minus 10 to plus 100
Vapor Pressure in pounds per square inch (Reid method)	5.5 to 7.0 abs.	0.1 abs.	2.0 to 3.0 abs.
Autoignition Temperature Degrees F.	plus 840 approx.	plus 475 approx.	plus 480 approx.
Distillation Range Degrees F.	plus 110 to 325	plus 325 to 450	plus 135 to 485
Heat of Combustion Btu's per pound	19,000	18,600	18,700

have been calculated to have a rate of flame spread of between 700 to 800 feet per minute whereas the rate of flame spread for the kerosene grades of turbine fuel under the same condition is substantially lower and is less than 100 feet per minute. This is a very important factor in evaluating the severity of the fire hazard.

It should be emphasized that this slower rate of flame propagation for the kerosene grades of fuel does not hold where the fuel is released in a "mist" form. This agrees with the similar behavior of the fuels as regards their flash point discussed earlier. Where a "mist" condition exists, the speed of flame spread in the "mist" will be essentially the same regardless of the liquid spilled. It is usually true that this fuel "mist" will, however, be consumed in seconds (rather than in minutes) after a serious crash and once the "ball of flames" burns off, approach to effect rescue can be made. Rarely will fire departments arrive at the scene until after this phenomenon occurs. The main difficulty lies where this "mist" explosion propagates flame over large spilled areas of fuel.

Conclusions

We started this article by giving two examples of recent accidents involving turbine-powered aircraft. No two crashes are identical and it is very difficult to make a summation, even from the 103 accidents that Mr. Beard has analyzed. We believe, however, that his conclusions are valid and that kerosene offers a safety advantage over other grades of aviation fuels.

Having kerosene, however, does not reduce measurably the seriousness or severity of fire situations in aircraft crashes to the extent that we can relax any protection recommendations for aircraft rescue and fire fighting services at airports. This will come only when we shift to other types of fuels (possibly atomic) or until the basic design hazards in existing aircraft are corrected to prevent the fuel "mist" situation and to eliminate the multiplicity of ignition sources in aircraft following crash accidents.

The Locked Door

by Robert S. Moulton,
Consulting Fire Protection Engineer,
Charter Member, Society of Fire Protection Engineers,
Honorary Life Member, National Fire Protection Association

YEARS ago, as a new NFPA employee, I became curious about a fire exit from our office, and decided to try it. At lunch time I entered the stairway, went down to the street level, to a door leading to a little-used alley. The door was locked, presumably to prevent pilferage. Returning up the stairs, I found all the doors locked from the stair side, until I got back to the door I had entered, which I had taken the precaution to fix so that it would not lock against my return. What a death trap this stairway might have been in case of fire! This particular condition was corrected the same day when we reported it, but how many times it was repeated throughout the country, nobody knows.

Once at an NFPA annual meeting I was approached by representatives of a concern who wanted me to look at a new device they had perfected to prevent unauthorized access to the dormitory of a girls' private school. The idea was an electric lock on the exit doors, which could be released by pressing a button in the principal's office. Until the button was pressed, the door could not be opened from either the inside or the outside. They thought this was a wonderful method of safeguarding the virtue of the young ladies.

When I asked them, what was the matter with the ordinary spring lock, which most people use on their own front doors, they said that it could be opened by the girls to let the boys in. I then asked, was there always someone on continuous duty in the principal's office, and, if so, how did that person know that there was a fire in some out-of-the-way place? They had no satisfactory answer. I then said that no mechanical contrivance could defeat the sex urge, and they reluctantly gave up their idea.

In the course of a survey of the fire safety of the schools in a large southern city, I found a group of children receiving a dancing lesson in the gymnasium. The building had excellent exits, but all four of them were locked, and only an obscure side entrance was in use. In another gymnasium, in a college, all exits except the main front entrance were securely locked during basketball games to prevent loss of admission money. In an eastern city all the side doors of a large convention hall were locked while some thousands of women were attending a meeting. Even when these conditions were called to the attention of management, no one seemed to think there was anything wrong.

An exit from an assembly room in a large hotel in an eastern city was locked because the exit led past the kitchen, and food might have been stolen. The manager refused to unlock the exit until compelled to do so by the fire department. The saving in dollars, or whatever it was that led to the locking of the doors, was far more important to the management than the remote possibility that someone might be trapped behind these doors in case of fire. No one seemed to realize that the exit doors had been provided, at considerable expense, for a definite purpose which was completely defeated by the locks.

How many lives have been lost in fires due to locked doors? Nobody knows, because it is human nature to "cover up" in any case of death where locked doors were a factor, though there are some specific cases on record, such as the school for delinquent boys in Arkansas where 21 lives were lost due to locked doors.

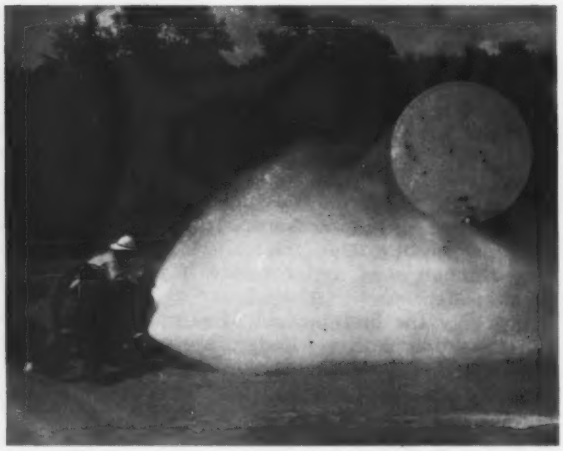
The devices to permit locking doors to prevent their unauthorized use, and at the same time to make them available as emergency fire exits, are many and varied. Some completely fail in their purpose, such as the locked door with the sign "Emergency Exit — Key in Mr. Blank's office." The key with the glass cover which must be broken to open the door is almost as bad. Who could find and use it during a panic rush from fire, particularly in the dark?

The Building Exits Code, official standard of the National Fire Protection Association on life safety from fire, which started with the organization of the NFPA Committee on Safety to Life in 1913 and has evolved over many years, has recognized this problem, and suggests some methods of dealing with it, but none 100 per cent satisfactory. The simplest method is the sign — "Emergency Exit Only," the effect of which is purely psychological. A paper seal which must be broken to use the door is another method. Perhaps the most common is the alarm bell, which rings automatically when the door is opened. There is no limit to the automatic methods which might be used. It would be possible to spray the user of the exit with water, with a colored fluorescent dye, or with the odor of skunk, which would certainly discourage illicit use of exits, but would not prevent their use to escape from fire. However, as far as we know, such extreme measures have not been tried. One must maintain some sense of balance. All any measures can do is to discourage improper use of exits — the real criminal will work his way through steel and concrete if the incentive is great enough.

Probably the best method of safeguarding exits is through proper design — design that will make the exit discharge clearly visible, so that the use of exits may be easily supervised. In this, discharge of exits through an unprotected street floor area should be avoided, and is generally prohibited by the Building Exits Code. There are, however, various ways of dealing with such situations, ways which the fire protection engineer can find and apply to the individual building.

Both 1½- and 2½-inch hose lines were used for controlling the fires. Here, a Tulsa crew sweeps a straight stream from a 1½-inch line along the top of the tank near the vent to simulate proper cooling of the tank during fire.

A chief officer moves in with hose crews in approach to simulated fire under the tank. Purpose is to sweep fire away and reduce the pressure in the tank and use fog protection to permit approach to the valve.



Wide angle fog streams are used as hose crews move to end of tank. Valve is in upper right, center, and fire officer will move to this position to shut off flammable liquid.

practice workout!

Tank Fire Control — subject of new movie

Tulsa, Oklahoma, Fire Department handles tough fire problems for important new NFPA motion picture film.

by
Miles E. Woodworth
Flammable Liquids
Field Service Specialist

Photos by G. E. Bomford, Phillips Petroleum Company

Fire officer reaches valve under protection of cooling hose streams. In actual fire, crews would have to be alert for flashback of fuel on the surface of the water.

cameras running!

HOW do you control a fire involving a horizontal tank that holds thousands of gallons of flammable liquid? What kind of nozzles do you use? What size hose lines? What should your fire officers do? How much water do you need? *Where do you position your men and what must they know for their own life safety?*

The answers to these questions and much more information of great importance to the fire service will be included in a new motion picture (running time 25 minutes, with color and sound) now in the stage of final editing. It was prepared and filmed under the direction of the NFPA Committee on Visual Education in cooperation with representatives of the American Petroleum Institute and other specialists from the oil industry and related companies. NFPA member Dr. Oliver W. Johnson, Consulting Engineer, served as special adviser. The "work horse" role was handled magnificently by the Tulsa, Oklahoma, Fire Department, under the direction of Chief G. L. Sartain.

Purpose of this new film is to make available to the fire service a graphic presentation of what fire fighters should do when they respond to fires involving horizontal tanks filled with flammable liquids. The proposed script and contents of the motion picture were discussed and planned for more than a year.

Right from the start it was decided that the problems created for filming would be realistic and that fire control techniques used would be the best suitable for similar fire conditions. The positioning and handling of hose lines, the adjustment of nozzles for straight and spray streams, the movement and commands of fire officers, the use of portable monitors and other related fundamentals were taken into consideration.

Chief Sartain's Tulsa Fire Department was chosen for the difficult role because it is in the heart of the oil territory. Because of the potential hazards, members of the department were asked to volunteer for the assignment, which they did enthusiastically.

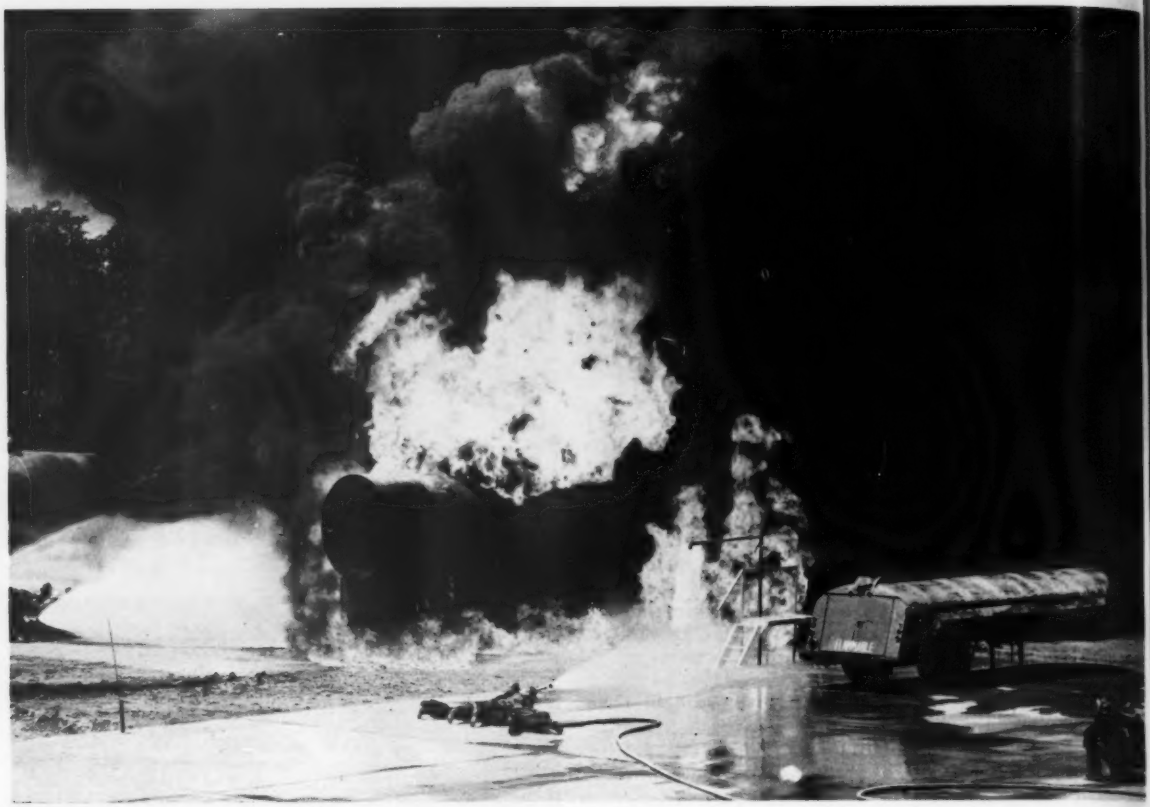
Back in the latter part of June these men spent five complete days undergoing special training for the proposed fire situations, followed by three days of actual fire fighting for the film. In a fenced area at Tulsa's training center the API and individual oil companies had constructed two horizontal tanks and a vertical tank just as they would be in a typical installation. One 8,000 gallon capacity horizontal tank with piping for a loading platform was filled with 3,000 gallons of gasoline and rested on concrete supports. Another horizontal tank, of 12,000 gallon capacity, held 500 gallons of gasoline and was otherwise filled with water. This rested on steel supports. Also featured was a 10,000 gallon vertical tank holding 2,000 gallons of gasoline.

In creating the fire problems, consideration was given to the limitations of small fire departments, those which operate with only a few personnel, perhaps depending on call fire fighters or volunteer response. It was realized that if such a fire department expects to handle a serious flammable liquids fire with safety to its personnel, it must recognize its own limitations as well as the potential of its manpower and equipment. For some fires, adjustable fog nozzles on 1½-inch lines provide much needed mobility and cooling effect to permit ap-

Ground fire builds up beneath horizontal tank as chief officer, at left, alerts crews for move-up. An inadequate size vent was installed on this tank to emphasize cooling effect of hose streams. Initial attack was with a 1½-inch line on each side followed by two 2½-inch lines with 30-degree fog patterns as backup.

First crews move in with 1½-inch line from each side, cooling tank with straight streams as shown in practice sequence. Other crews are ready with back-up lines. Portable monitors were then used to simulate a situation too dangerous to fight.

Two 2½-inch lines with a 1½-inch back-up line are now in operation sweeping ground fire to permit approach to tank **(see next page).**



Intense fire boils from tank vent as 2½-inch lines with a 1½-inch back-up line with fog streams move toward the end of tank. Subsequently, a chief officer moved in to shut off valve. Note crew in foreground protecting tank truck which was deliberately exposed to the fire. These men had to worry about the ground fire which spread toward their position.

proach. For other fires, approach with adjustable nozzles on the less mobile but bigger capacity 2½-inch lines gives the only certain protection to fire fighters. Straight streams and spray streams are needed depending on the fire situation.

Of extreme importance when hose crews are moving in are back-up lines. The film shows the use of both 1½-inch and 2½-inch hose lines in attack as well as in back-up. Attention is also given to the placement and use of portable monitors when a situation is too dangerous for hose crews to approach.

It is well known that the basic technique for handling horizontal tank fires is to cool the tank shell and simultaneously sweep away any ground fire so that the pressure in the tank will be reduced. Past fires have proven that tank vents must be of proper size in order that the pressure may be relieved before the tank ruptures or rockets from its supports. The film brings out the importance of cooling the tank shell with hose streams by showing one fire-involved tank with an inadequate sized vent. For this scene fire fighters moved in with 1½-inch lines with two 2½-inch lines as back up, and then they withdrew to allow portable monitors to control the situation.

Certainly one of the important features of this film will be the dramatic illustration of size and intensity of the fire which can occur at these horizontal tanks. While a number of fire departments already have had actual experience, perhaps tragic, with similar fire situations, a great many fire departments which have not encountered such fires may not appreciate the scope of the fire fighting problem. Persons responsible for the planning, directing and completion of this motion picture anticipated that such fire departments would study the film, then incorporate the techniques in their own pre-fire planning programs.

As shown in the photos on these pages, there were two major sequences of fire fighting — one showing the attack on a fire involving the horizontal tank on concrete supports; the second showing a similar attack for a fire involving a horizontal tank on steel supports.

CAST OF CHARACTERS

Tulsa Fire Department

Chief G. L. Sartain	R. E. Conley
Capt. L. R. Ford	G. W. Prideaux
Capt. J. K. Mendenhall	E. L. Simpson
T. R. Coatney	B. G. Whiteaker
B. J. Reeves	Capt. W. H. Adams
J. A. Shields	C. W. Bowman
Capt. John McQuaig	J. G. Hubbard
W. H. Turner	W. A. McKim
Capt. R. G. Buckingham	H. G. Reid
Capt. Gus Dugan	K. H. Berryman
G. O. Burton	Will Everidge
J. K. Warfield	P. N. Moffett
P. D. Wiginton	Louis Ryan

Training Personnel

N. A. Phillips, *Drillmaster*	H. N. Warnock
C. W. Willis, *Asst. Drillmaster*	F. L. Atteberry
W. D. DeWitt	

A ground fire was built beneath a horizontal tank on unprotected steel supports. Straight streams from two 1½-inch lines were used to cool supports before approach.

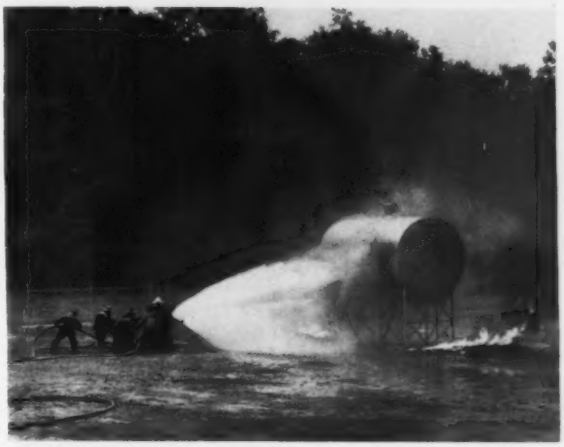
As ground fire was swept away, a 2½-inch straight stream was swept over tank to provide cooling effect as other streams continued to protect the steel supports.

It is anticipated that the film will be completed and available from NFPA later this year.

Members of the NFPA Committee on Visual Education who advised on the film sequences and script, took motion pictures and performed the editing and addition of sound included: Emmett T. Cox, Western Actuarial Bureau, Chairman; John E. Barman, Missouri Inspection Bureau; Carl N. Clanton, Kansas Inspection Bureau; Harold E. Kuhlman, Oklahoma Inspection Bureau; and Steve Smith, Topeka, Kansas.

Representatives of the American Petroleum Institute who were on hand to advise on setting up the tanks, tank venting fire control operations, and other details included Jack McKenna, Jack Savage, Homer Wheatley, H. T. Markee, Keith McClure, W. F. Burris, Carl Adams and G. E. Bomford (Still Photographer).

Tulsa Fire Department Personnel who spent the eight days of rigorous training and fire fighting operations are listed in a box on page 28.



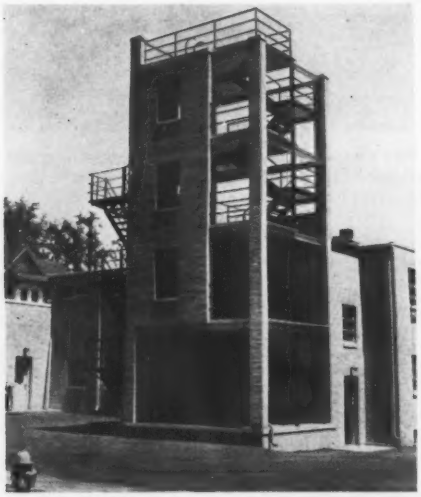
Finally, crews switched to fog patterns to sweep away ground fire as well as to cool the tank contents and permit closer, more effective approach to the tank.

After fire control procedures had been filmed, the horizontal tank was filled two-thirds with water plus 500 gallons of gasoline. A ground fire was reignited to show the effect of fire on unprotected steel supports. Guesses of the time till collapse ranged from three to sixteen minutes.

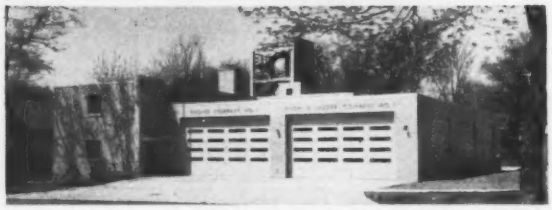
In four minutes, 42 seconds, the supports collapsed, breaking off the 2-inch pipe connection and causing a small split at the head-to-shell joint at the opposite end. Fire department personnel should keep this experience in mind when a real fire occurs in a similar installation.

REGIONAL ROUND-UP

A spot check of progress and plans of NFPA member fire departments and other fire service organizations in various regions.



New training tower is located in rear of Fire Station No. 1 in Rockford, Illinois.



Rockford's Fire Station No. 1 was put in service last May.

New 750 gpm pumper recently put in service in Rockford.

This deluge wagon was constructed in the Rockford Fire Department repair shop.

ROCKFORD's modern Fire Station No. 1 was put in service last May, reports Chief Wayne E. Swanson. Twenty-four men are stationed in this new building, which houses an engine company, a ladder company, and a reserve ladder and engine. Training classes are held in a large classroom, under the supervision of First Assistant Chief Thomas J. Hafey, Training Officer. A five-story training tower is located in the rear of the new station, and future plans include the building of a Fire Training Academy adjacent to the training center.

New apparatus includes a 750 gpm pumper, which was recently put in service at Fire Station No. 10, and a custom-made deluge wagon which was constructed in the Fire Department Repair Shop. Made by Master Mechanic Elden Raasch and Mechanic Arnold Dunbar, the new wagon replaces a unit destroyed by fire last year. It features a 10 KW generator, two large deluge guns, and compartments containing special equipment used for fighting large industrial fires. This unit will be brought in on a special call and can be used for electrical emergencies.

The Northern Tazewell Fire Department, in *Washington*, has added a new American LaFrance 750 gpm pumper on an "850" Ford chassis. Other apparatus in service includes a 500 gpm pumper, a 1,000 gallon tanker and an emergency pickup truck.

Illinois recently stepped up efforts in aerial detection of forest fires. At present, two aircraft (Cessna 180 and Beech Mentor 2 place) are being used to supplement the state's forest fire tower detection system, making it possible to detect fires beyond the present range of the towers. Quicker action upon fires has resulted in a lower burned acreage the past year, reports State Forester E. E. Nuuttila.

Because water is unavailable, the Division of Forestry depends mainly upon line building, and hand tools, backpack cans and fire rakes are still the main tools for this. Maintenance costs have been greatly lowered since fiberglass has been used in the construction of backpack cans, water tanks and tool caches.

Concerning the use of radio in the forestry program, Nuuttila states, "Expansion of our radio network, the utilization of two frequencies, and closer coordination with the U. S. Forest Service in communications has permitted better coverage for both the Federal Forest Service and the State Forestry Division in detection and suppression."

From *Lawton*, Chief H. V. Hancock reports that the fire department has set up a long-range program with the mayor and City Council which allows improvements to come from the regular annual budget. This appears to be better than the city's previous method of renewing fire equipment through expensive bond issues. Two fire stations have been relocated and a site has been picked for another. The building, apparatus and manpower for this third station will be covered in the next fiscal budget. There has been a 10 per cent increase in personnel, and a full-time fire marshal and drillmaster have been added.

New training courses in Oklahoma this year included four district schools for fire department officers and a Rookie Academy for probationary firemen on paid fire departments. A total of 85 men attended the Fire Department Officers' School, according to R. J. Douglas, Head, Fire Protection Department, Technical Institute, Oklahoma State University, Stillwater. He has scheduled more officer classes for next year. Fifteen men from 11 cities attended the Rookie Academy, which was established to help the smaller cities train one or two new men. Classes in the intensive one-week course were held daily from 6 A.M. to 10 P.M. The 1961 Oklahoma State Fire School emphasized outdoor demonstrations. Featured topics included Tricks of the Trade, New Equipment, Handling Fires in Metals, High Energy Fuels and Other Hazardous Materials.

More training news comes from E. D. Kirkpatrick, Chief of the *Nichols Hills* Fire Department. Plans are under way to make training films of the department's standard hose lays and pumper operations in each "fire phase" evolution. The 16 mm films will be taken by a photographer from a local TV station. The department also plans to step up its in-service home inspections. Besides eliminating hazards, inspectors will mark the homes of invalids, make a survey of tornado shelters and acquaint the public with the services available from the fire department. The fire department photographer will make 35mm slides of special points of interest for use in training classes.

In the interest of fire prevention the *Bartlesville* Fire Department, headed by Chief Gerald Vaughn, has installed a "Fire Run Score Board" on the front of the Central Fire Station. The board records the number of fires for the current month as well as the total number of runs made during the year. A fire prevention slogan over the scoreboard is changed each month. During Fire Prevention Week the slogans are arranged beside the road at the highway entrances to the city.

Chief Gerald Vaughn, of the Bartlesville, Oklahoma, Fire Department, points to the department's fire prevention novelty, a "Fire Run Score Board."

The department is now using SCUBA diving equipment for underwater rescue and recovery operations. Divers, under the direction of Assistant Fire Chief Frank Knode, are trained by the Oklahoma State Highway Patrol Rescue Squad. The SCUBA equipment supplements the standard recovery techniques.

To strengthen the department's training program, Captain Phillip Reese has been appointed full-time Training Officer. Required duties in the department are automatically performed during training sessions. Records are maintained, and company officers turn in a monthly training report to the Training Officer. He, in turn, reports to the Chief's office. The City Manager also gets a copy.

These aircraft crash units are in service at the Will Rogers Airport in Oklahoma City.

Oklahoma City has doubled its area during the last year, reports Fire Chief Haskell Graves. With its new annexed areas the city now comprises 415 square miles. Several new fire stations are being planned for the new areas, and two new tank pumpers have been put into service. The pumpers, each carrying 700 gallons of water, are especially valuable during the grass fire season. The department also has two other pumpers, and future plans call for the purchase of at least two more. Three 1,000 gpm pumping engines were recently put in service, and the department is purchasing a new rescue squad unit.

In 1960 a fire station was opened at each of the city's municipal airports. The station at Will Rogers Airport is equipped with two aircraft crash units and one nurse truck; the Tulakes Airport station has one aircraft crash unit.

A training program for fire department personnel is under the direction of the Oklahoma State University. The courses are taught by fire department instructors as well as instructors from the University.

The Oklahoma State Bureau of Investigation is making a special effort concerning the inspection of schools, rest homes and nursing homes, states Ralph L. Venamon, Director, Arson-Inspection Division. The Division is a member of the Oklahoma State Department of Health Advisory Council, which promulgates rules and regulations governing the hospitals, nursing homes and rest homes throughout the state. Annually, the Oklahoma State University conducts a firemen's training school and an Arson Seminar. Last fall's Seminar had a total enrollment of 156, with representatives from twelve states and two foreign countries. The Bureau has established a film library consisting of 14 different fire prevention subjects. The films are loaned without cost to fire departments and civic organizations in the state.

State cars are equipped with radio, and a polygraph (lie detector) operator serves the department.

(*Continued on page 40*)

MAKE YOUR NEW FIRE STATION ADEQUATE!

NFPA Chief Engineer Horatio Bond calls attention to important elements of modern fire stations which frequently are overlooked in the original planning and design.

REQUIREMENTS for fire stations can be identified best if considered in three parts: (1) yard space required, (2) number of pieces of apparatus to be housed, and (3) housing of the persons who will occupy the station. These requirements are affected by climate, by architecture of a neighborhood, and by the part which the station is to play in community life.

The apparatus floor section does not have to be built any better than an automobile showroom and repair shop. It could be light steel frame with ample daylight through large windows and would not require heating to temperatures needed for living quarters. On the other hand, it may be desired to make the living quarters substantial, well appointed, to match the best residences of the neighborhood.

By considering these as separate problems, the community building a fire station can spend appropriate money on each part of the station without making one part involve expenses of construction which would be decided principally by the other. For example, large interior storage space for apparatus can be avoided when there is yard space for extra pieces of apparatus which may be assigned temporarily to the station.

Yard Space

As a minimum, there should be yard space for parking automobiles of fire fighters on duty or, in call departments, for each man who must respond for duty. Preferably, parking space should be figured for double this number of men, as some yard space is needed for fire company training. In paid departments, at time of shift changes and when off-shift men are called in, even generously figured space may be crowded. For new stations at old sites where such space has not been provided, or in congested areas, it might be reasonable to provide a basement or roof area for parking. Parking for community meetings at the fire station will need additional space.

Apparatus Space

Space for two pieces of apparatus is the minimum to be provided. This might be realistic for a company assigned to cover an outlying part of a city. It would be less likely to be realistic for the first station built by a new fire department or for the replacement of a station in a built-up area of a city.

A new fire department should look forward to adding a second pumper and a ladder within a few years, and its first station should be built large enough for three first-line pieces and three reserve pieces, or be designed so that apparatus floor space can be added economically. The same considerations apply to a new station for an existing fire department.

The response required in existing fire departments is a minimum of two engine companies and a ladder company in residential districts, with twice that response for principal mercantile and industrial districts. If a city wants to keep the number of stations to a reasonable minimum, it must provide apparatus floor space for all first-line and reserve pieces which can be housed in any one station.

In designing apparatus space, street frontage should be provided for each first-line company housed. A station from which two engine companies and a ladder company would normally respond would need three doors. It might be desirable to provide a door in the rear for each door in front, enabling apparatus to get out by an alternate route if the main doors are blocked. Such an arrangement is particularly important when reserve apparatus is stored behind first-line pieces.

Each door opening should be at least 14 by 14 feet. This would define headroom in the apparatus space at about 16 feet. A floor space of 16 by 40 feet per piece of apparatus provides working space around each truck, a feature which is often overlooked.

Two engines and a ladder truck can be put in a two-door station with an apparatus floor about 32 by 80 feet, but this would allow no room for reserve pieces. A better layout would be a station with three doors front and rear, which could house four pumpers and one ladder truck in a space about 48 by 80 feet. If an additional reserve ladder truck is to be housed, a four-door station about 54 by 80 feet would be in order.

These floor area figures are for apparatus alone. They could be skimped a bit in some cases by building the apparatus floor to dimensions which exactly house existing pieces of apparatus. In that case, new pieces a foot or two larger in any dimension could cause serious crowding and inconvenience. The figures contain no allowances for other features which must be provided in the apparatus space or for the cars of a battalion or district chief or other chief officer which might be housed in the station.

In any station the apparatus floor should be arranged to facilitate the work of cleaning, daily inspection, servicing, and making minor repairs. Floors should be waterproofed and properly drained. Walls and other finish should be easy to clean. In cold climates it may be desirable to install steam or hot water lines to keep the front apparatus ramp free of snow and ice.

Inside the apparatus room, or at another suitable interior location, a 1½-inch water connection should be provided for filling apparatus tanks during cold weather. A small storeroom is needed near the apparatus for miscellaneous supplies and equipment, and a shop room is also useful.

GASOLINE PUMP. An underground gasoline storage tank should be provided, with the pump located outside the building. All gasoline tank-filling operations should be performed in the open air and not inside the station. (*See NFPA Standard No. 30 — Ed.*) This may be done under a protective canopy that also serves to keep snow away from the doorways.

LOCKERS AND SHOWERS. Racks are often provided for firemen's clothes near the apparatus, and clothes lockers should be provided to house the fire clothing of off-duty men. Also desirable is a shower facility on the apparatus floor for washing fire clothes so that soot and dirt will not be tracked through the living quarters.

PATROL DESK. Near the front of the apparatus floor there should be a glass enclosed booth or office with patrol desk console for the watchman. This should be near the door of the station with visibility to the outside so that the watchman can see that the street is kept clear for response of the apparatus. The console includes radio equipment, telephones, microphone for station paging or "public address" system, fire-alarm recording equipment, and switches for controlling lights, doors, and bells. Running or assignment cards, street addresses, street maps, the fire company journal and other items are kept at this point.

DRYING FACILITIES. Storage space for spare hose may be provided in connection with suitable drying facilities, usually a hose tower. Waterproof salvage covers are treated much the same as hose. Salvage covers can be suspended for drying from pipes near the ceiling of a heated and well-ventilated room.

MAIN DOORS. A means of opening the main doors of stations from the driver's seat of apparatus is desirable. A common arrangement provides that doors swing closed against springs. A trigger release, operated by a cord from the driver's seat, open the doors. Operating doors electrically from the patrol desk is convenient but there should also be positive manual means for opening the doors. There is at least one case on record where a fire in a station destroyed all the apparatus because the doors, arranged for remote control, could not be operated. If doors are arranged to close automatically after the apparatus has left quarters, it is necessary to provide safety stops that will prevent injury to persons who might be standing in the doorway when the doors close.

LIGHTS. Adequate lighting should be provided, with control switches operated from convenient locations and also at the patrol desk. On receipt of a fire alarm, lights all over the building may be thrown on by a special switch. The switch may also be arranged to open the front doors, to close the doors automatically, and to put out the lights after the company has responded to an alarm.

In stations where it is not practicable to keep a man on desk duty at night, the master house light switch is operated from fire alarm headquarters. The electric system should include suitable outlets for battery chargers, vacuum cleaners, and other appliances. The switch arranged for remote control of lights should not control convenience outlets or such equipment as clocks, refrigerators, fans, and drying equipment.

HEATING AND AIR CONDITIONING. Heating and ventilation of a fire station should be as effective as that provided for any good building of modern design. Hot water or steam heat has been found to be generally satisfactory. In planning boiler capacity, the need of heat for the hose tower, drying rooms and street ramps should not be overlooked. The fact that the front doors are periodically opened should be kept in mind and radiators or blowers should be placed near these doors to provide an even distribution of heat. Modern practice is to cut off dormitory and office areas from the apparatus floor and to control the heat in these areas on separate thermostats to facilitate both comfort and heat economy.

Dormitory Space

When planning dormitory facilities, space should be allowed for a number of men representing full company strength, regardless of the present strength of the company. It is customary to provide officers with rooms separate from the firemen. Under present platoon or group systems there are two to four officers for each company and these men may have separate rooms which serve as combined offices and sleeping quarters. An economical arrangement is for the officers of a company to share a common office and common sanitary facilities, but to have separate sleeping rooms. The quarters of a chief officer should be separate from the quarters of other officers and men.

It is often desirable to have quarters for battalion chiefs and aides completely separate from fire company quarters. The chief and his aide (who serves as battalion secretary) have a complete suite with office, dormitory, kitchen, lounge, and toilet facilities and garage. This is a very practical and economical arrangement because the chief officer makes hundreds of runs and trips which do not concern the companies or apparatus in the station where he is quartered. When he has his own quarters, office, and garage, there is no need to concern the company or watch desk of the fire station.

In older stations and in many new stations the company men usually have a large dormitory room. Beds should be grouped to permit men to reach apparatus by the shortest route. Where land area permits, it is desirable to have the dormitory on the same level as the apparatus floor, otherwise pole holes and doors should be sufficient in number and placed to prevent congestion. Pole holes must have suitable automatic enclosures to prevent noise, loss of heat, and accidents.

Sometimes men on opposite shifts are required to share beds. This cuts down the size of dormitory required, but for a small initial cost and additional floor space, a sufficient number of individual beds may be provided. Since all men do not occupy the sleeping quarters at one time, the beds of those on opposite shifts may be placed relatively close together. As a rule, seven feet of length and six feet of width per bed should be allowed.

OTHER FACILITIES. Lockers in the apparatus space may be sufficient in departments where men respond on call, but are needed in the dormitory space for paid men on duty. In either case the lockers should be in a well-ventilated and dust-free area. The locker and toilet space should be separated from the sleeping space so that men may retire and be free from noise or disturbance in the locker and shower rooms. It is desirable to separate the washroom and shower area from the toilet room. A closet for the storage of bed linen, towels, and similar items must not be overlooked.

A day room is essential, and in some stations a library or classroom is provided. Others include a small gymnasium or handball courts. These rooms are important in keeping men mentally and physically fit. It is a general practice to provide kitchen facilities including stove, food lockers, and electric refrigerator. Dining table area should be sufficiently large to accommodate the maximum number of men who may eat at the same time.

From a talk "Missiles on Our Streets!" given at the 65th NFPA Annual Meeting —
by P. H. Strietzel, Technical Staff, Aerojet-General Corporation

WHAT'S IN A

SOLID PROPELLANT ROCKET MOTOR?

A SOLID propellant rocket motor consists of a pressure chamber (usually a steel tube with steel end closures) which contains a single grain of solid propellant material, an igniter (usually located at the forward end and removed and replaced by a plastic cap during shipment), a nozzle assembly at the aft end (with fire resistant throat and exit cone), a weather seal (of plastic film located in the throat area) and mounting hardware.

To prevent fire from extending from the bore to the outside of the grain, most rocket motors have a flexible, fireproof liner which adheres to the inside of the pressure chamber and to the outside of the grain. The grain is poured in a fluid condition into the chamber, against the liner and around a core. When the propellant material has solidified sufficiently the core is withdrawn leaving a hole which extends through the longitudinal center of the grain. This hole is called a "bore."

The surfaces of the grain inside the bore are left exposed for ignition and burning. The bore may be of various configurations but must be of a form that will ensure that the area of the burning surfaces will remain unchanged during the time required for fire to consume all of the grain.

In normal operation the igniter is fired first. Gases from the igniter materials immediately raise the pressure in the chamber to an operating level required for the specific thrust and to that critical level required for the designed burning rate for that grain. At the same time the igniter ejects burning material (often heated to a temperature in excess of 6,000 degrees Fahrenheit) over all exposed surfaces of the bore, heating them above their auto-ignition temperature which is over 300 degrees F.

These surfaces ignite and continue to burn in successive layers at a rate controlled by the initial pressure established by the igniter and the area of the grain being heated to auto-ignition temperature by the flame front. Released gases maintain the chamber pressure at a constant level by replacing the gases which flow through the nozzle at exactly the same rate at which they escape. This ensures a continuous pressure against the inside of the chamber exactly opposite and on an area the same size as the nozzle. This pressure is defined as "thrust" and is equal to the square inches of nozzle throat area times the pressure per square inch present at any time in the chamber.

The burning time and pounds of thrust are expressed in the "thrust identification" of each motor. For example: A motor identified by the symbols "15KS–1000" is interpreted to mean that the propellant will burn for fifteen seconds during which time a continuous pressure of one thousand pounds will be exerted against the inside of the forward end of the motor. The letters "KS" identify the type of propellant used.

In a rocket motor, if fractures occur in the grain or if the grain becomes separated from the case liner because of severe impacts from dropping or rough handling, a fire ignited in the bore (or on a spot on the grain heated to auto-ignition level through the chamber wall by a surrounding fire) will extend into the fractured, or over the exposed, surfaces of the grain. This may generate gases faster than they can escape through the nozzle and cause the chamber pressure to rise above the critical level required for normal burning.

When this critical pressure level is exceeded, a phenomenon occurs which is peculiar to this category of propellant grains. The increase in pressure increases the burning rate, and the increased burning rate further increases the pressure, accelerating both with great rapidity until the pressure chamber bursts.

The violence of such a burst will vary with the number of grain fractures and/or the area of grain surface exposed to a flame front by separation from the liner. This will be relative to fracture and separation surfaces which will be added to the bore, which, when ignited, are sufficient to release gases normal to maintain safe chamber pressures.

The violence will also vary with the tensile strength of the chamber wall since internal pressure will be much greater in a strong than a weak-walled chamber before it bursts. However, most Aerojet commercial and military rocket motors have thin walls. In bonfire tests performed on 15KS-1000 motors the pressure sometimes tore holes in the chamber walls and the propellant burned out through the holes.

Each grain is composed of various ingredients bound together by a thermosetting plastic which also acts as a fuel. Other components consist of: an oxidizer, such as potassium perchlorate, ammonium perchlorate or ammonium nitrate; plasticizers to improve casting; modifiers to control ballistic characteristics; and sometimes metal powder.

At normal or high storage temperature Aerojet propellant grains are very cohesive and slightly flexible or "rubbery." At low temperature they tend to become brittle and may crack when subjected to severe impacts

Each type of propellant has a characteristic auto-ignition temperature. They can be ignited only when their temperature is raised to auto-ignition level. Because they contain their own oxygen, they can be ignited inside a rocket motor by external heat and will continue to burn without initiation by sparks or flame.

The motor liner and propellant grains have great resistance to heat penetration, but if their ambient temperature were raised slowly over a period of many hours or days until large portions or all of the grain reached auto-ignition temperature simultaneously, there would probably be instantaneous and explosive release of all of the potential gas and heat of the portions which had reached that temperature. This is defined as "cook-off."

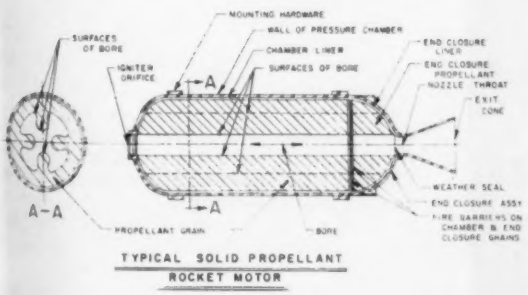
Tests in which our rocket motors were burned in bonfires indicated that portions of propellant below auto-ignition level would not be involved since many fragments of various sizes of burning and unburned propellant were thrown about the test area of those motors which burst. Auto-ignition temperature of propellant grains in 15NS-250 commercial motors is 380 degrees F and in the 15KS-1000A1 is 550 degrees F. This is typical of the auto-ignition temperature of present composite propellant grains. These motors do not generate volatile, flammable gases which could extend to locations remote from the grains and lead fire to them. Because each grain contains its own oxidizer, when ignited they burn persistently.

Fire on a burning grain could be extinguished if the propellant ahead of the flame-front could be cooled below auto-ignition level but it is believed that even deluging or flooding would not accomplish this. If these motors are deluged or flooded in a surrounding fire before ignition occurs, the temperature on the grain surfaces can be kept below auto-ignition level and they will not ignite.

Section 73.50 of the ICC Regulations, defines an explosive as "any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat."

These grains burn as a solid fuel at a controlled rate and the motors are designed to function by use of continuous pressure supplied by gas released from this fuel over a period from a few to many seconds, and not by explosion. The remote possibility of "cook-off" places them in the category of explosives, but they are more like flammable solids because they do not tend to explode from impacts of high explosive shock waves or in bonfires, are difficult to ignite and when ignited burn persistently.

Since 1942, we have shipped over 700,000 rocket motors, containing over 53,000,000 pounds of this type of propellant. Unpackaged units have dropped forty feet on concrete, dropped from cargo nets and have been run over by trucks. They have been transported and handled by unskilled labor and transported to locations around the world with no report of ignition or detonation from handling and shipping. However, if accidentally ignited in a surrounding fire, even if they do not become propulsive, they may throw themselves about, burst at various points over the pressure chamber, and throw fragments of the motor violently about the area.



TYPICAL SOLID PROPELLANT ROCKET MOTOR

AEROJET-GENERAL CORPORATION
SKETCH
DRAWN BY — P.H. STRIETZEL

Many rocket motors do contain explosive propellant grains. Throughout the nation thousands of chemists are making every effort to confine the maximum of potential energy in each pound of propellant. New components of propellant grains and new compositions are proliferating. Some may be impact sensitive, or under some abnormal condition in a surrounding fire, they may develop chamber pressures which would cause transition from normal, rapid burning to detonation.

In any case, accidental ignition of the propellant grains from a surrounding fire is probably the greatest danger. Every feasible effort should be made to keep rocket motors away from fire or potential flammables because although some propellant grains may be safely batted as baseballs and used as ash trays, others may behave like high explosives.

If the bore of a propellant grain is accidentally ignited, sufficient pressure may develop in the chamber to lift and propel the motor in erratic flight. This can be prevented by apertures of equal area on each end which will ensure neutral thrust, or by destruct charges similar to Primacord actuated by pressure, or by mechanical devices which will open the chamber to keep the internal pressure below propulsive levels.

Some rocket motors must be transported in temperature controlled environments using electric blankets, heat pumps, space heaters in oversize containers, or other temperature control equipment. In some instances, elaborate recorders of shock, vibration, relative humidity or other data must be operated during transportation. Such equipment usually requires a gasolene, fuel oil or similar motor to operate an electric generator as an auxiliary power supply on the carrier. Auxiliary power units or other heat sources are prohibited by ICC Regulations on vehicles which carry explosives unless specifically authorized by an ICC Special Permit.

The type of container to be used cannot be determined until the ICC explosive classification of a rocket motor has been established because motors of different classifications may require different containers. To determine the classification, tests are first performed by the Bureau of Explosives or at Aerojet on uncased samples of each formulation of propellant. Data from these tests are usually sufficient for the cognizant agent to determine whether it is forbidden to offer the propellant for shipment uncased or cased in a test unit or motor.

A propellant grain cased in a thick-walled test unit or rocket motor may change its characteristics. Therefore its ICC explosive classification as a device must be established. This may require extensive testing of test units or of sub-scale or full-scale motors at desert or other remote test sites in compliance with military or other approved test procedures.

Rocket manufacturing is a new industry. The packaging designer who attempts to solve the problems involved is like an explorer in primitive country. Uniform regulations for the huge motors now in prospect are badly needed.

THE DANGEROUS TASK OF FIRE COMBAT

IF ANY man doubts whether fire fighters need training let him look at the pictures at right and below. They were taken during the terrible moments of a violent fire which occurred in Richmond, Virginia, on July 5. They are representative of the typical sudden emergency which can confront any fire department any time.

This Richmond fire, at a petroleum bulk plant, resulted in the death of one man and a monetary loss exceeding $260,000. It started shortly after 1:00 A.M. as a barge began unloading 450,000 gallons of gasoline into the shore side tanks of a gasoline bulk plant. Just about 45 minutes later a heavy concentration of vapors was ignited by an undetermined source. The flash was seen to spread from the barge to the tank area and then to several homes across the street.

Four men on a tug tied to the barge leaped overboard and swam to the opposite bank of the river. The clothing of one of these men ignited and he ran for fifty yards before someone tackled him and ripped away the burning clothing (with ninety per cent burns over his body, he died several days later).

Someone struck a box alarm immediately and Richmond fire fighters, commanded by Chief Edgar A. Sherry, responded.

Subsequently, multiple alarms brought a total response of 16 engine companies, 3 ladder companies and a squad company plus 2 special units. The sudden violent eruption of the fire caused a near-panic among residents. It was reported that 400 families in a ten-block area were evacuated as erupting "fire balls" threatened to burn many homes. Forty-five children were lost temporarily from parents. Some families weren't reunited until twelve hours later.

The fire fighters' job was to protect exposures as well as possible until the burning gasoline was consumed. A bulk plant employee, dressed in protective clothing, managed to close valves on the lines connecting the barge and the storage tanks, and this stopped the flow of gasoline. Later, however, it was determined that the fire had destroyed a 160,000 gallon tank and a 70,000 gallon tank, a tank car loading rack, a barge dock and a network of pipe lines. Despite the rapid start of the fire, Richmond fire fighters managed to protect other tanks with turret nozzles and to limit the spread of fire among nearby dwellings. Pumpers drafted water from the James River as well as using hydrant supply. Five fire fighters suffered burns and blisters from the intense heat and the protective clothing of many was scorched.

Is there any question that a man needs training for a situation like this? (*Photos by Richmond Times Dispatch*)

Photo at left shows firemen directing heavy streams to protect a transformer and a vertical storage tank. Photo at right shows similar action as flaming gasoline erupted.

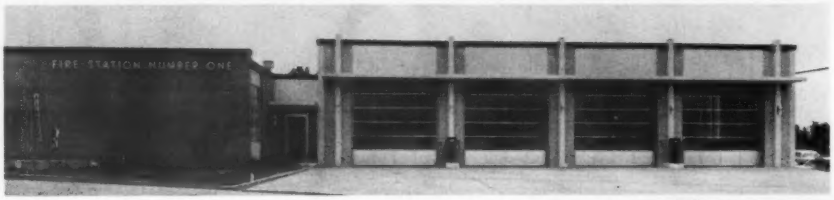
"TRUE NOBLEMEN OF OUR REPUBLIC" . . . thus did a grateful America dub its firefighters a century ago. To symbolize this vigorous heritage of *today's* firefighters, we've mingled the romantic past with the streamlined present. The resulting contrast is apparent in the photo above. The jaunty rig now resides in a museum. And the stiff formal poses are relics of the gaslight era. But the smooth trim lines of the safety and rescue equipment from Mine Safety Appliances Company are strictly '60. And what a difference a complete line makes today. Measured in time or money or precious human lives, the savings are very real indeed. For a demonstration or specific product bulletins contact your local MSA Fire Department distributor. Or write: MINE SAFETY APPLIANCES COMPANY

MSA

Vigilant Hand Pumper courtesy of Carnegie Museum, Pittsburgh

Legend for MSA Products

1. Fire Hood. 2. Fire Approach Suit. 3. Chemox Canister. 4. Streamlined Firemen's Helmets. 5. Chemox Oxygen Breathing Apparatus. 6. Bunker Suits. 7. Clearvue Facepieces. 8. All-Service Gas Mask. 9. Maskfone. 10. Explosimeter. 11. Air-Cub Mask. 12. Porto-Power Rescue Equipment. 13. Demand Air Mask. 14. Stretcher. 15. Foille Burn Kit. 16. Pneolator Resuscitator. 17. Half-Hour Chemox.



Atlanta's Fire Station No. 1, built at a cost of $210,000.

These two new Pirsch 1,500 gpm pumpers have been assigned to Atlanta's high value district.

Regional Round-up

(*Continued from page 31*)

Improvements are still being made in *Atlanta*, reports Chief C. H. Hildebrand, Jr. Two new 1,500 gpm pumpers were placed in service in April and assigned to the high value district. Two more pumpers are scheduled for delivery this fall. Also new to the department is Fire Station No. 1, completed recently at a cost of $210,000. Occupied in June and dedicated last month, this station houses an 85-foot aerial ladder truck, a 1,500 gpm pumper and a combination rescue and salvage unit. Additional space has been provided for expansion. Photos above show the new building with the apparatus.

Word from Chief J. Kenneth Harrison, of *St. Simons Island* Volunteer Fire Department, concerns a new 2,000-gallon tank truck which the volunteers obtained through Civil Defense for only $46. So far they have installed a 500 gpm front mount pump with two 150-foot 1½-inch pre-connected lines, a 150-foot 1½-inch pre-connected foam line complete with inductor and a 40-gallon supply tank, booster hose and reel, 2,000 watt generator and three-way radio complete with public address system and siren. The radio equipment cost $1,053, of which Civil Defense paid half and the volunteers raised the other half from donations. Also new for the department is a rescue squad, members of which recently completed a 12-hour course in first aid.

State Fire Marshal F. E. Robinson calls attention to changes in the State Firemen's Pension Fund Law. An amendment passed at the last session of the General Assembly and signed into law by Governor Ernest Vandiver permits members who had dropped from the rolls to rejoin the Fund within four months after last July 1. In addition to other changes concerning eligibility the amendment also offers more leniency for volunteers who had failed to attend 75 per cent of fire alarms or drills. Another new amendment changed the retirement benefits of the State Firemen's Pension Fund from $60 per month to $72 per month.

Safety Fire Commissioner Zack D. Cravey and Fire Marshal Robinson scheduled a number of activities for youngsters this summer. This included fire safety instruction to 15,000 4-H Club boys and girls, a summer camp for colored junior fire marshals, fire safety clinics for school plant employees, instruction for junior nurses at state hospitals and a week-long Fifth Annual Junior Fire Marshal Conference with 500 high school juniors and seniors attending, representing every high school in the state.

W. Neal Ratcliff, Supervisor of Training, reports that firemen's training in Georgia is conducted with the guidance of the Fire Institute, created a few years ago as part of the Industrial Education Department of the Georgia Institute of Technology. To coordinate the training resources of the Institute of Technology, the State Department of Education, local school systems and local fire departments, a special advisory committee is nominated by the Georgia State Firemen's Association. The training staff includes 24 men who are chiefs, assistant chiefs, drillmasters, captains, and lieutenants of fire departments in larger cities. During off-duty time they assist with fire service training in the smaller communities.

The Fire Institute has a demonstration truck with modern fire fighting equipment. This is available to all fire departments in the state for training purposes in either local classes or zone fire schools. The zone schools have been very successful. The most recent was held at Augusta following the Georgia State Firemen's Association Conference in Rome in mid-August.

Also available for training are 51 films on fire fighting and related activities. These are sent free to any Georgia fire department on request. Currently, textbooks for state fire service training are being analyzed and revised.

In Georgia there are 153 counties which include almost 23,000,000 of the 24,000,000 forested acres in the state. Director Ray Shirley of the Georgia Forestry Commission reports that the expansion of new industry has brought an expansion of the fire hazard in forested areas. In the first half of 1961 more than 44,000 acres of forests were destroyed by fire. Nearly one-third of this acreage lost could be attributed to more than 2,000 fires that resulted from debris buring. Between January 1 and June 30 there were a total of 5,528 fires on the protected forested area.

At the Commission's ten district offices there are 19 state-owned light monoplanes which go into action to supplement fire tower observation on days when the fire danger is extremely high. The Commission also has a TBM aircraft equipped for dropping fire retardants. All planes are equipped with two-way radio and loud-speakers for air-to-ground communication. One change brought by the increased use of aircraft was to transform the Commission's vehicles from green to white, permitting easier identification by air patrol planes.

In the field a sandcaster has been tested by a team from the Southern Forest Fire Laboratory and the Commission. The machine was developed by the State of Michigan and the U.S. Forest Service. Director Shirley reported that studies were made on the amount of sand it will cast, distance the sand can be thrown and its effectiveness on indirect and direct attack on fires.

CAN YOU HELP THIS COLLECTOR?

RECENTLY we were told about young Gregory Gardner, the son of Charles E. Gardner, Assistant Chief of the fire department in South Euclid, Ohio. Gregory is 13 years old and is afflicted with cerebral palsy. He wears a brace on his right leg and only has the use of his left arm and hand. He didn't walk until he was six years old.

Gregory for a long time has been interested in fire protection and law enforcement, and some time ago he began a collection of shoulder patches and badges of fire departments. The South Euclid Fire Department is a member of NFPA, and the boy has a chance to read FIREMEN magazine and to correspond with different fire departments with his mother's assistance.

In a note to FIREMEN magazine recently, Mrs. Gardner said, "Would it be possible for you to put a few lines in your publication expressing Greg's thanks for the many letters and patches he has received? I feel that in this way many could be reached and would know of his appreciation for their generosity. . . . Also, if there are any others who would wish to be represented in the collection and could find time to send him a contribution to his hobby, Gregory would be pleased and proud to hear from them. He waits for the mailman every day and is so disappointed when mail is not received. Words of thanks could never begin to compensate for the many, many hours of enjoyment he has received from the letters and patches."

A postscript to the letter should offer something of a challenge to readers of this magazine. It says, in part, "Gregory is very anxious to enlarge his fire department collection. At the present time it isn't as complete or as large as his police department collection . . ."

Are there any readers of this magazine who wish to help this thirteen-year-old boy who has a sincere interest in the fire service and an appreciation of its members? If so, you can write to: Gregory Gardner, 5030 South Barton Road, Lyndhurst 24, Ohio.

"Resuscitation of the Unconscious Victim"

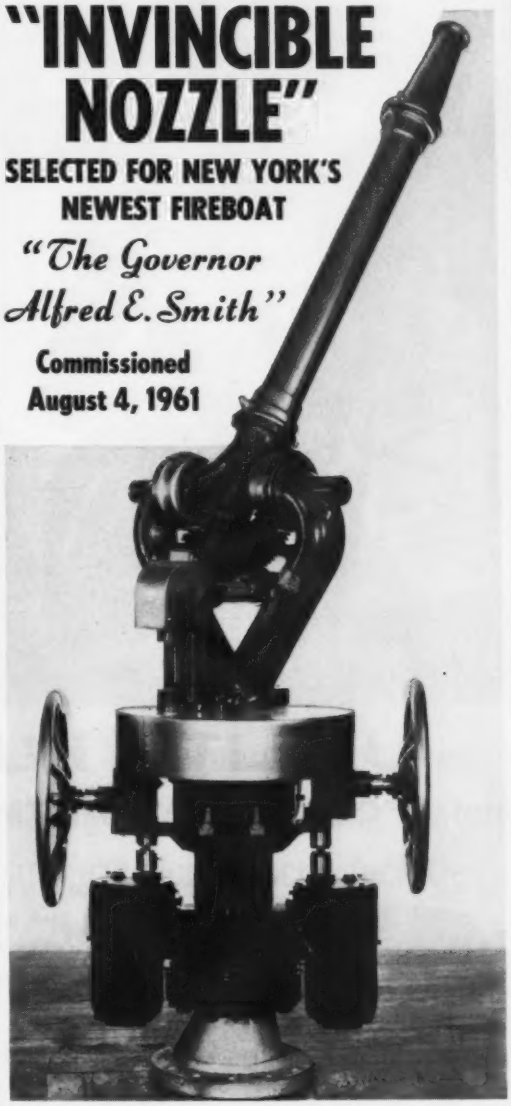
THE second edition of an 88-page illustrated booklet with the above title has been published by Charles C. Thomas, 301–327 East Lawrence Avenue, Springfield, Illinois.

Measuring 4⅜ by 7⅜ inches, the booklet covers various topics of importance concerning resuscitation of unconscious persons. The text was written by Doctor Peter Safar, Department of Anesthesiology, Los Angeles City Hospitals, and Captain Martin C. McMahon, Baltimore Fire Department Ambulance Service.

In addition to covering mouth-to-mouth and other methods of artificial respiration, the book touches upon special resuscitation methods for newborn children, cardiac victims, victims of chest and multiple injuries, infection and other unusual conditions. A useful bibliography is included with "tear-out sheets" for quick instruction in mouth-to-mouth breathing and closed chest cardiac massage.

Copies of the book may be obtained for $2 each by writing to the publisher at the above address.

THE
"INVINCIBLE NOZZLE"
SELECTED FOR NEW YORK'S NEWEST FIREBOAT
"The Governor Alfred E. Smith"
Commissioned August 4, 1961



New York City's newest fireboat has four "Invincible Nozzles" at 2000 gpm and one 3000 gpm electrically motor driven by remote control from the Pilot House.

Why were "Invincible Nozzles" selected? For effectiveness, efficiency and rugged durability proved by the fact that nine "Invincible Nozzles" on New York's Fireboat "The Firefighter" have never needed repair or replacement parts since installation in 1939!

F. N. McINTIRE BRASS WORKS, INC.
377 Putnam Ave., Cambridge 39, Mass.

New, compact, lightweight

UTILITY PUMP
FOR FIRE DEPARTMENTS

The new PROSSER 900, ¾ H.P. portable submersible pump is ideal for use where direct drafting is not feasible or for cellar drainage after floods or fires. It can be driven from auxilary 1000 watt generator power and delivers up to 120 gallons per minute.

The unit operates submerged in any position, is safe, odorless, quiet to use, and requires no priming. Unlike many submersibles it may be operated dry for considerable periods of time. Seals and bearings do not require outside lubrication.

The PROSSER 900 is supplied with a removable strainer, 20 ft. of cable, watertight switch and 6 ft. of power cable. Discharge and suction threads are 1½"—9 NST. An accessory mushroom strainer is available for cellar draining. The pumping unit weighs under 20 lbs. and is only 5⅜" x 11⅜" long. This new unit is the product of over 20 years submersible pump experience, assuring you dependability, long life and utility at low cost.

For further information and the name of your nearest distributor phone PR 4-8600 *or write:*

PROSSER INDUSTRIES, INC.
900 EAST BALL ROAD, ANAHEIM, CALIFORNIA
Select distributor territories now open. Your inquiry is invited.

Planning Your Entry?

MORE than 1,800 cities, industrial firms, military units and government divisions are expected to participate in the National Fire Protection Association's 1960 Fire Prevention Contest.

The contest, an international competition to provide recognition for excellence in the field of fire safety education and performance, is in its 34th year. Entries last year exceeded all previous totals.

City entries are classified and judged according to the size of the community. The only prerequisite to entry is a fire prevention program, which in many instances is a joint project of the local fire department and community organizations like the Chamber of Commerce.

Entry forms, returnable by November 30, are available from the NFPA offices at 60 Batterymarch St., Boston. There are separate forms for municipal, industrial, government and military entries.

Top winners in the municipal division last year were Martinsville, Virginia, and Hamilton, Ontario.

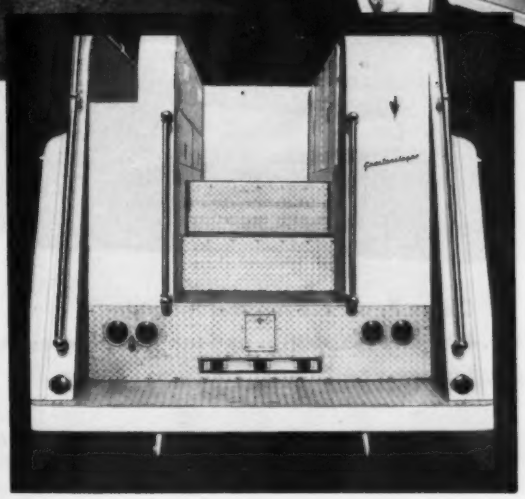
For Collectors!

SOME of the most attractive color pictures of old-time fire apparatus are available in postcard form from the Firemen's Home of the State of New York in Hudson, New York. Priced at 50¢ per set of 10 ($1.50 for set of 30) the postcards show some of the grounds and buildings of the Firemen's Home as well as the beautifully cared for equipment displayed in the renowned museum on the grounds.

The complete set of 30 postcards is a good investment for anyone interested in the history of the American fire service. Individual pieces of apparatus shown on the cards include: a 1725 Newsham engine with hand buckets, a 1783 hand pumper, a 1792 bucket carriage, an 1812 "Old Skiver" hand pump, an 1820 Gooseneck engine, an 1842 Gooseneck which belonged to Water Witch Engine Co. of New York, an 1846 hand engine built by Agnew & Company, an 1850 "Piano Type" pumper built by James Smith, an 1865 DeGraw hose carriage, an 1875 "Hay Wagon" engine, a horse-drawn LaFrance steam pumper, and other apparatus.

Income from the sale of postcards is used to buy tobacco and other personal items for the retired members of the fire service who live at the Firemen's Home.

IS THIS THE STYLE FIRE-RESCUE UNIT YOUR DEPARTMENT NEEDS?



Niles, Michigan unit combines emergency fire-fighting features and excellent rescue facilities

This Gerstenslager rescue unit for Niles was developed to provide a real assist at fires as well as operating independently in other kinds of rescue work.

It combines complete compartmentation inside and out for easy access to all equipment and tools as well as portable generator and pump. Body encloses a 300-gallon booster tank for emergency fire fighting. Ample hose is provided.

Fire-rescue units must meet local conditions and requirements, and Gerstenslager has the experience to provide for these needs. Your Gerstenslager representative is nearby, ready to help you with your planning. His service is available without obligation. Write, wire or phone.

THESE ARE SOME OF THE FEATURES!

Short wheelbase Ford chassis Model C-550 tilt cab. Rear step and deck constructed of 3/16" aluminum tread plate for sure footing. Body and chassis are two separate units. Equipped with emergency front and rear warning lights, two front spot lights, two rear flood lights and roof mounted siren. Ample grab-rails for all crew members.

DEDICATED TO 100 YEARS OF TRANSPORTATION

GERSTENSLAGER

THE GERSTENSLAGER COMPANY • WOOSTER, OHIO • PHONE AN 2-2015
CUSTOM BODIES SINCE 1860

SECONDS SAVED CAN MEAN LIVES SAVED...

Be Prepared For Emergencies With The Complete, Dependable

Stebco
RESCUE CRASH TOOL KIT

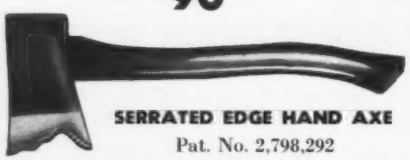
(As Developed and Manufactured For U. S. Air Force—Patent Pending)

Contents Of Complete Stebco Rescue Crash Tool Kit!

Metal Cutting Saw — 18″ blade.
Aircraft Cable Cutter — 1/8″ to 1/4″ capacity; 14″ long; new-type cutting jaws cut cable without deforming ends.
Lineman's Pliers — 8″; insulated grips.
Hack Saw Frame — adjustable 8″ to 12″. Faces 4 ways.
3 Hack Saw Blades — hard toothed; silver steel; fast cutting.
Grappling Hook and Rope Sling Combination — 40″ long.
2 Phillips Head Screw Drivers — one each 4″ and 8″.
2 Slotted Head Screw Drivers — one each 4″ and 8″.
3 Neoprene Rubber Plugs; 3 Hardwood Plugs — to plug fuel and control lines. Resist attack of high octane fuels, oils, aromatic solvents.
Vise Grip Wrench — 10″ long.
1 Serrated Edge Hand Axe.
1 Safety V Blade Rescue Knife.

Weight — 21 lbs. Complete Kit — No. CRK-5
(Including Axe and Rescue Knife)

$90.00



SERRATED EDGE HAND AXE

Pat. No. 2,798,292

Safety designed, non-wedging cutting edge for piercing metal. High grade carbon steel, heat treated, hardened and tempered. Hickory handle. Axe may be purchased individually:

No. RN3: $15.50 ea. with Sheath.

No. RKB2 EXTRA RESCUE KNIFE BLADES — Set $2.00

SAFETY V BLADE RESCUE KNIFE

Pat. No. 2,805,476

For cutting seat belts and harness without injuring the body. Precision made of high strength aluminum alloy. Highly polished anodized finish. Tip fitted with Dzus Key. Finger fitting contour handles are self-positioning for quick, easy use in dark. Will cut 10,000 lb. strength webbing in one easy stroke. Int rchangeable, precision ground high carbon steel blades. May be purchased individually: **No. RN2: $15.50 ea. with Sheath.**

These Tools are recommended in NFPA No. 403 and No. 406M as Standard Equipment

For AIRPORTS and FIRE DEPARTMENTS

In car, plane, train and truck crashes, the speed with which you can get through the wreckage to release pinned-in victims can very well be the difference between life and death for them. Seconds saved may mean lives saved! The well-planned Stebco Rescue Crash Tool Kit — originally developed for the U. S. Air Force — is an all-purpose array of implements that have proven their effectiveness in crash and fire emergencies. Kit contains everything needed to quickly and efficiently cut through metal, webbing, wood, rope and other obstructions. Comes in heavy canvas, weatherproof, mildew resistant carrying case. Rolls into compact bundle 28 inches long; 6 inches in diameter. Fastens on both ends, with two strong carrying handles in center. Tools are held firmly in place, yet each one is easily accessible.

Call your distributor or write

STEBCO INDUSTRIES, INC.

1415 WEST JACKSON BOULEVARD
CHICAGO 7, ILLINOIS

Manufacturers of Safety and Survival Equipment for the Armed Forces of the United States

Day Care Centers

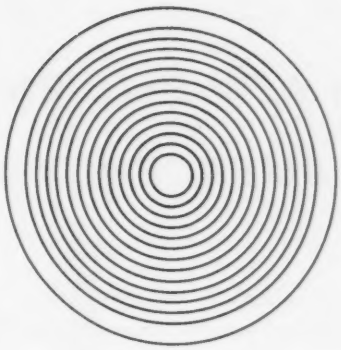
F. J. SULLIVAN, Assistant Manager of the Montana Fire Rating Bureau, has forwarded a copy of Montana's new Fire Safety Regulations for Day Centers, Nurseries and Homes. Prepared by the Fire Marshal Committee of the Montana State Fire Chiefs' Association, by other specialists in fire safety and by the State Department of Public Welfare, these regulations became effective July 1 of this year.

The 16-page, 8½- by 11-inch mimeographed text was developed as a guide for the protection of children in day care centers and homes and to insure basic uniformity in fire safety regulations throughout the state. Section One, the first eight pages of the booklet, includes definitions of approved equipment, occupancy, materials and type of construction required by the State's fire safety regulations. Section Two gives specific recommendations for children's day care centers, with particular emphasis on exits, stairways, access, automatic sprinklers, fire extinguishers and heating.

Section Three deals with equipment and operational features for these specific occupancies. Items covered include staff evacuation plans, smoking, signs and lighting, combustible contents, occupancy restrictions and maintenance. New day care centers are covered in Section Four.

An Appendix lists additional standards for fire protection required by the Montana State Fire Marshal, emphasizing, in particular, fire extinguisher requirements (which prohibit the use of extinguishers containing toxic or poisonous vaporizing liquid) together with a general plan for fire and evacuation of such buildings.

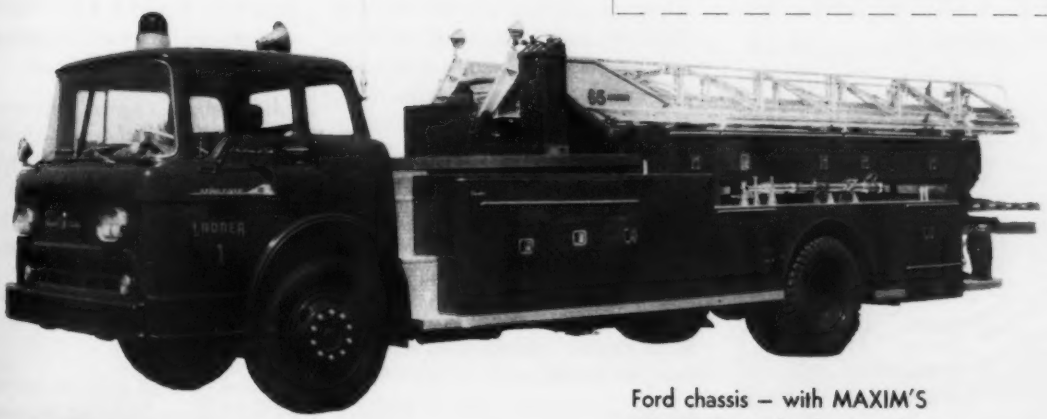
WHAT IS IT?



Stare at this figure for a few seconds. It represents something of significance to every fire fighter. Guess what this is, then turn to page 60 for the answer.

From MAXIM'S Photo File

TISBURY, MASS.
Model XLA-65
Aerial – 65 feet



Ford chassis – with MAXIM'S
ALL STEEL Hydraulic Aerial

MAXIM MOTOR COMPANY MAXIM MIDDLEBORO, MASS.
Established 1888

In reply refer to Photo No. 4512

MAXIM MOTOR COMPANY, Middleboro, Mass.

An important message for Fire Chiefs...

WHEN SECONDS COUNT, SPEED HELP WITH NEW BELL ***GROUP ALERTING*** *AND* ***EMERGENCY REPORTING*** *SYSTEMS!*

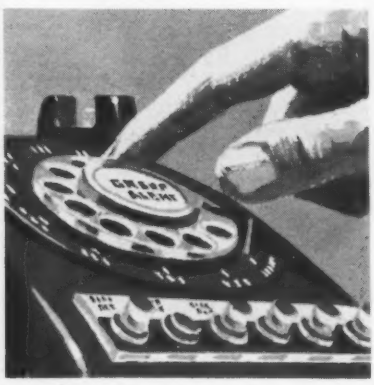
In a fire, or any emergency, even short delays can cost lives and property. That's why Bell Telephone System research has developed two unique types of communications that save time, get needed men and equipment to the scene—right away.

The GROUP ALERTING AND DISPATCHING SYSTEM was developed especially for communities with volunteer fire departments. With one spin of a headquarter's telephone dial, many volunteers are called simultaneously, receive recorded instructions, are on their way.

The EMERGENCY REPORTING SYSTEM provides instant street to headquarters contact. Headquarters gets quick answers to the vital questions, *what* and *where?* Men and equipment are dispatched immediately, without confusion.

Right now communities throughout the country are adopting these new systems. Here's why . . .

GROUP ALERTING AND DISPATCHING



Alerts volunteers fast. One spin of dispatching telephone dial and men needed are called with distinctive ring on each man's regular telephone at home or at work.

Speeds action. Dispatcher repeats message once, hangs up. His words are recorded, exact message reaches all volunteers. Recording continues five minutes, may be extended.

Reduces cost. Group Alerting service is flexible. Alerts only the men that are needed.

Improves traffic control. Private telephone-alerts mean less traffic congestion. Chances of accidents that can happen when curiosity seekers get in the way of emergency equipment are minimized.

Eliminates capital investment. Service depends largely on existing telephone networks. Equipment provided by Telephone Company. After nominal installation charge, only cost is monthly service charge.

Adapts easily for use by civil defense units, rescue squads and police departments.

Assures you of reliable operation. All equipment installed, maintained and regularly checked by skilled Telephone Company technicians.

For full details, call your nearest Bell Telephone business office. Ask for a Communications Consultant and he will give you the whole story.

EMERGENCY REPORTING SYSTEM

Saves time. Citizen calls control center from nearest street phone, reports exact location, nature of emergency. Phones strategically placed throughout city.

Reduces false alarms. In cities where Emergency Reporting is used, false alarm frequency has dropped significantly.

Cuts waste of manpower and equipment. Nature, extent of emergency known immediately. Duplicate dispatching eliminated, even if several persons report same emergency.

Provides printed records. Calls recorded on automatic equipment that prints time, date, call box number.

Doubles as police call box. Police headquarters reached, bypassing emergency switchboard. Service is flexible, too. Reporting stations, dispatching circuits rearranged fast to meet changing conditions.

Eliminates costly upkeep. Regular Bell System monthly service charge covers all repairs and maintenance.

Assures you of continuing operation. Circuits continuously self-tested. Alarms notify control center of interruption to service. Telephone Company personnel are quickly sent to trace, repair trouble.

BELL TELEPHONE SYSTEM

Visit our exhibit and play "Fire Ringo" at the International Association of Fire Chiefs' Convention, Convention Hall, Las Vegas, September 24-28.

EVENTUALLY

YOU WILL TRY WET WATER...

WHY NOT START WITH

Stevens' Penetro-Wet?

THE SAFE WET WATER

Positive Rust Protection. Harmless to Packing. Prevents Flare-Back on Petroleum Spill Fires. It Foams.

WRITE TO US ABOUT OUR WET WATER PROPORTIONER.

S. G. STEVENS CO.
3859 LOCKWOOD AVENUE
TOLEDO 12, OHIO

NEW!

Sky GENIE

FOR SAFE CONTROLLED DESCENT OF PERSONNEL AND EQUIPMENT

For Rescue & Escape Operations by:

- FIRE DEPARTMENTS
- RESCUE SQUADS

EASY-TO-USE! LIGHTWEIGHT! COMPACT!

"SKY GENIE" allows a variable rate of descent, predetermined by the user. One person using only finger-tip pressure, controls descent; either at point of descent, above or below. "SKY GENIE" enables suspension at any point.

WRITE FOR COMPLETE INFORMATION

Manufacturers of ATLAS "Safelux" Life Saving Hoists

available exclusively through

ASE

ATLAS SAFETY EQUIPMENT CO., INC.
175 NORTH 10th ST., BROOKLYN 11, N. Y.
and its authorized distributors
FRANCHISES AVAILABLE

See "SKY GENIE" demonstrated at the IAFC Convention in Las Vegas, September 25 to 28, 1961

Aluminum Siding—A Hazard? Experience Needed

DURING the last few years many miles of aluminum siding have been applied to dwellings and other buildings. There has been much discussion about the hazard, if any, involved when the metal siding becomes energized with current from the electric services or lighting.

In order to examine the scope of this problem, we would like to collect information from fire chiefs, fire marshals and other qualified persons on every known case of fire or shock involving aluminum siding. If you have any such information, please forward it to the NFPA Fire Record Department.

For example: Early in April of this year the wife of a homeowner in Tacoma, Washington, turned on her front porch light after dusk. As she did so all lights in the house suddenly went out. The homeowner while going to the circuit breakers in the rear of the house noticed a red glow in one of the windows and found fire involving the exterior fuel oil tank. He told his family to leave the house while he called the fire department.

Investigation revealed that the front outdoor light had been attached with nails driven through the aluminum siding. A fault in the fixture had allowed electricity to travel through the aluminum siding, a total distance of thirty feet, down at least eight courses of siding and around a corner. The electrical currents discharged to the fuel tank one inch away, igniting the residual oil on the exterior tank surface as well as the oil-soaked ground under the tank, nearby grass and debris.

Using a garden hose the homeowner fought the fire until the fire department arrived to complete extinguishment. Afterwards, with observers standing by the tank, the battalion chief in charge activated the light and the observers saw the spark jump from the siding to the tank. Examination of the light fixture showed that the aluminum siding had not been cut back from the fixture mounting, that the porcelain on the fixture was broken allowing the base of the socket to contact metal in the fixture, thus energizing the aluminum siding.

An epicure, dining at Crewe,
Found quite a large mouse in his stew.
Said the waiter, "Don't shout
And wave it about,
Or the rest will be wanting one, too!"

— ANON

MORE THAN 85% OF ALL SUBURBAN AND RURAL FIRES REQUIRE THE USE OF BOOSTER HOSE LINES. And, firemen know it pays to get these lines into action *fast!* Dependable, efficient, fast action is what you get with Hannay Hose Reels. Hannay Reels are designed by firemen, and built to give top performance on the job, year after year. That's why so many fire chiefs insist on use-tested Hannay Hose Reels on every truck they buy.

Today's fireman moves fast . . . he has to, and Hannay Hose Reels get him moving faster.

REELS BY HANNAY.

SUSTAINING MEMBER

CLIFFORD B. HANNAY & SON, INC., WESTERLO, NEW YORK

"Back Pressure"

A GALLON of water (U. S. measure) occupies 231.03 cubic inches and weighs 8.34 pounds. Each cubic inch of water weighs 0.03608 pounds. Thus, a column of water one square inch in cross-sectional area and one foot high weighs 0.433 pounds, and if the column is 100 feet high it weighs 43.3 pounds. This weight is termed pressure "head" by engineers and "back pressure" by fire fighters.

Thus, every time water must be pumped to a higher elevation, 0.433 pounds per square inch is needed to lift the weight of the column of water each foot of elevation.

In fire fighting it is common practice to add 5 pounds pressure for each story that the nozzle is elevated above the pump. This is based on an average height of 12 feet per story: 12 times 0.433 equals 5.196 or about 5.2 pounds pressure.

Of course, the 12-foot average height per floor may not fit a given situation. In many public buildings and institutions ceiling heights may be considerably greater, while in certain residential properties ceiling heights may average 8 or 10 feet per floor. Frequently, the first floor of a structure has a higher ceiling than upper floors.

In round numbers sufficiently accurate for fire fighting purposes, the pounds of pressure needed to elevate water are as follows:

Feet	Pressure (psi)
12	5
25	10
35	15
50	20
100	43
231	100

In usual fire fighting practice, differences in elevation of less than 25 feet can be ignored because these usually make a difference of less than 5 pounds in the nozzle pressure. This can be understood when it is realized that the pressure head due to elevation is but one factor in the total pressure requirement.

Take the situation of a 1⅛-inch tip on a 450-foot line of 2½-inch hose, supplied by a pressure of 125 pounds at the pump. In this case, if the nozzle is level with the pump, the nozzle pressure would be 50 pounds and the pressure loss in the hose, 75 pounds. If the nozzle is elevated 25 feet above the pump, there is about 10 pounds loss due to elevation. But, because some of this loss occurs in the line, the nozzle pressure only drops to 46 pounds and the pressure loss in the hose becomes 69 pounds. Thus, in the case cited, an elevation of 25 feet caused an actual drop in nozzle pressure of only 4 pounds.

When the nozzle is lower than the pump, the weight of the water increases the pressure. For example, assume that the pump is uphill 25 feet higher than the nozzle with the same 450-foot line having a 1⅛-inch nozzle tip. The pump is discharging at 125 pounds but the change in elevation adds 10 pounds to the pressure. In this case, nozzle pressure would be 54 pounds and pressure loss in hose would be 81 pounds. As the nozzle pressure increases or decreases, the flow also increases and decreases with a resultant change in the loss in the hose.

With a 1¼-inch tip on 400 feet of 2½-inch hose, each 10 pounds loss of pressure due to elevation results in about 3 pounds loss in nozzle pressure. An elevation of 35 feet would cause nozzle pressure to drop 5 pounds. With a 1-inch tip on a 450-foot line of 2½-inch hose, 10 pounds loss due to elevation (about 25 feet) will cause 5 pounds loss in the hose.

you can always count on dependability

E&J

THE NEW LYTPORT II

RESUSCITATOR • INHALATOR • ASPIRATOR

Precision-built to save the seconds that save lives. The dependable Lytport II is a product of 40 years' expert craftsmanship.

Pre-set pressures and simple controls permit immediate use. The Lytport II opens flat for instant access to all working parts. Entire instrument panel lifts out for best positioning.

In its sleek molded Fiberglas carrying case the Lytport II weighs only 28½ pounds (including oxygen cylinder). Rounded corners, oversize handles and perfect balance permit fast, easy carrying. Overall dimensions: 9½" wide, 10" high, and 24" long. Unit illustrated also accommodates two cylinders.

For dependable results put the Lytport II on your lifesaving team!

Ask your E&J dealer for a demonstration.

OHIO Ohio Chemical

For complete information, write Dept. F-9, Ohio Chemical & Surgical Equipment Co., Madison 10, Wisconsin • Ohio Chemical Pacific, Berkeley 10, California • Ohio Chemical Canada Limited, Toronto 2, Ontario; overseas, Airco Company International, New York City 17 (all divisions or subsidiaries of Air Reduction Company, Inc.)

NATIONWIDE

ADT

has the know-how and the facilities to supply automatic protective services from coast to coast. With service available in more than 2,600 communities, ADT can furnish appropriate protection to business, industry, institutions and Government installations almost anywhere in the country. When you are asked about private plant protection in your community, remember ADT—service available nationwide!

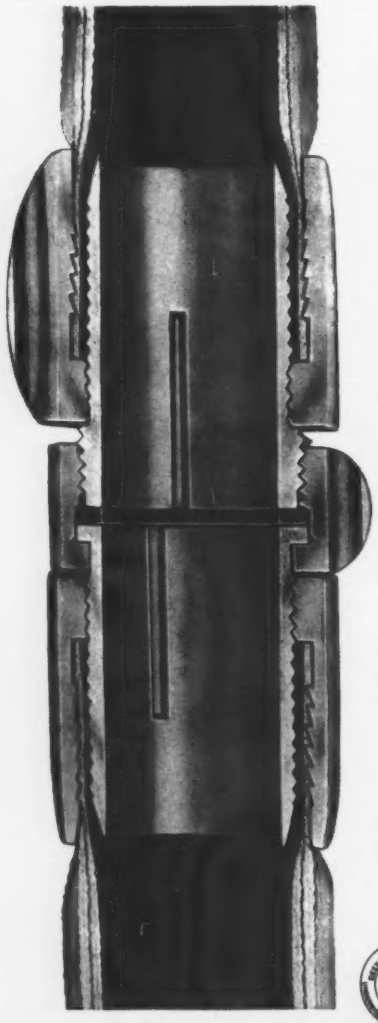
A NATIONWIDE ORGANIZATION

New Central Fire Station for Stockton

CHIEF J. L. Stevenson, of the Stockton, California, Fire Department, forwarded this photo of Stockton's new $450,000 Central Fire Station. Featuring a drill tower and training area in the rear, the building houses a two-piece engine company, two ladder companies, and a rescue squad. Assistant chiefs in charge of fire fighting are also quartered here.

The paved training area in back includes flammable liquid and LP-Gas installations, open tanks, a "Christmas tree," a drafting pit for pumper training, hydrants, and other items. The basement of the tower can be used for training fires.

The new building and the training center, dedicated May 6, will serve the 165 officers and men of Stockton's fire department, who operate eight engine, two ladder, and one rescue companies.



Put BAR-WAY in your "specs"

THE REUSABLE HIGH PRESSURE COUPLING THAT GIVES A QUICK, SURE CONNECTION FOR ALL TYPES OF JACKETED HOSE.

The simplified streamlined design of this precision coupling, which is basically the same as that of your booster hose, guarantees full flow, full pressure and ease of handling under all conditions. Fast emergency hose repairs can also be made in the field if you specify Bar-Way for original application.

Demand Bar-Way reusable couplings on your jacketed hose and watch your efficiency go up and the cost go down.

1½", 2½", 3" and 3" x 2½" Conventional Wing Lug in production. All other standard sizes and lug styles available.

Special engineering applications on request.

TESTED for 1400 lbs. pressure and 2400 lbs. pull under full pressure.

BAR-WAY® **BAR-WAY MFG. CO., STAMFORD, CONN.**

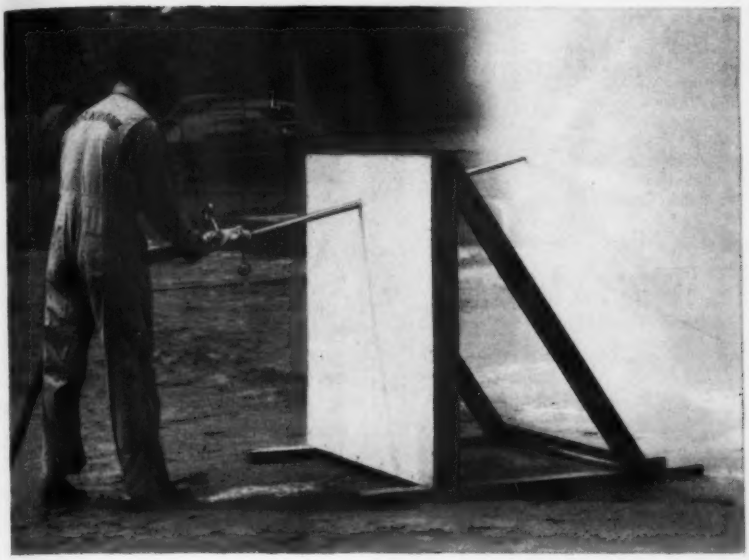
Occupancy Fire Record — Hospitals

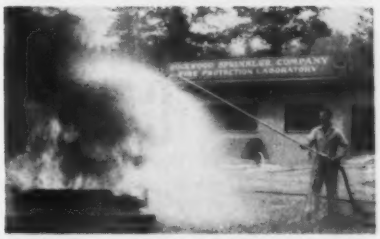
NEWEST booklet in the Occupancy Fire Record series is FR 61-1 — Hospitals. The 8½- by 11-inch, 24-page, paper bound, illustrated booklet presents the NFPA's latest analyses of hospital fires.

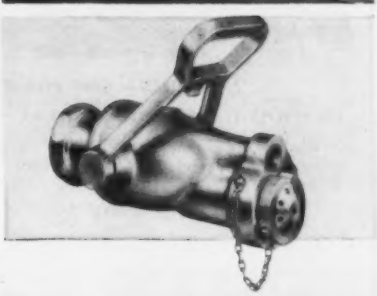
The booklet also includes a number of brief reports of actual fires ranging from moderate fire loss to those involving severe damage and loss of life by fire. Copies are available from the NFPA Publications Department at 50 cents each, with discounts for quantity purchases.

"There's a man trying to break into my room. . . . I *know* this is the fire department. . . . Well, my room is on the 5th floor and he needs a ladder!"

Adapts to all types of fires... IN SECONDS!







Rockwood's Six-way WaterFOG Nozzle

It's a firefighter's indispensable ally! That's the Rockwood All-purpose Type SG-60 WaterFOG Nozzle, the nozzle that puts out fires faster because it can convert to six separate discharge patterns right on the fire hose line. *And without loss of time!*

The SG-60 is a true all-purpose nozzle permitting water application in any of the accepted discharge patterns plus solid stream FOAM and FogFOAM, the speediest and most economical ways of applying foam. Thanks to its versatility the SG-60 can be used to fight all types of fires including wood, paper and cloth, flammable liquids and electrical. And regardless of the applications you use, your fire department saves money because *the SG-60 does the work of six nozzles, eliminates the need for "special" or single purpose nozzles.*

The SG-60 nozzle body and valve handle are made of lightweight, durable aluminum alloy with high polished finish. Valve consists of a hard chromium plated ball rotating against a synthetic rubber seat. All other parts are bronze, brass and stainless steel. The SG-60's three-position valve handle permits easy adjustment to firefighting conditions and the few attachments needed for special types of fire fighting can be adapted in a matter of seconds. For further information write Rockwood Sprinkler Company, Portable Fire Protection Department, 423 Harlow Street, Worcester 5, Massachusetts. A Division of The Gamewell Company, A Subsidiary of E. W. Bliss Company. Distributors in all principal cities.

Rockwood engineers water . . . to cut fire losses.

ROCKWOOD

PORTABLE FIREFIGHTING EQUIPMENT

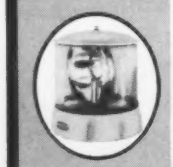
For Every Need . . . Every Budget!

MAKE YOUR OWN CHOICE!

There are complete lines of Carpenter Emergency Lights for all basic needs . . . the widest choice of powerful, dependable, durable lights available.

WARNING LIGHTS: Vehicle and stationary types . . . colored, flashing, oscillating, revolving!
HANDLIGHTS: Powerful "Portalites" with the famous extra-wide coverage! Rechargeable or dry battery types.
VEHICLE LIGHTS: Searchlights, floods, colored signal and warning lights for all service and emergency vehicles.
PANIC LIGHTS: Watchmaster "Automatalites" **automatically** guard against light failures. All types including explosion-proof, dust-tight, and remote control.

Your Guide to over 100 Emergency Lights . . . the Carpenter Catalog. Write for copy.



CARPENTER MFG. COMPANY

627 Bradley Street, Somerville 45, Mass. Telephone MOnument 6-4300

GLOBE FIREMEN'S SUITS

. . . "the suit that suits" — and we mean it!

3 MODELS — ONE FOR EVERY CLIMATE & SEASON

LIGHTWEIGHT—REGULAR—ALL-TEMP
Tough, long-wearing duck, waterproof interlining, plaid flannel or 100% wool liner

6 COLORS & WHITE
Black, brown, blue, red, olive drab, yellow

ALUMINIZED SUITS & COVER SUITS
Made from famous 3M aluminized fabric; reflect 90% of radiant heat; designed for intense heat protection; same choice of styles as standard GLOBE suits. Cover suits are worn over GLOBE duck suits.

SEE YOUR AUTHORIZED GLOBE DEALER OR WRITE FOR FULLY ILLUSTRATED CATALOG

SEE US AT THE I.A.F.C. CONVENTION, LAS VEGAS, NEV., BOOTH 105

STANDARD SINCE 1901

GLOBE SUITS

GLOBE MANUFACTURING CO. PITTSFIELD, N.H.

Rope Control Device

A NEW safety device for controlling the lowering of personnel and equipment by rope is now being distributed by Atlas Safety Equipment Company, 175 North 10th Street, Brooklyn 11, New York. Named "Sky Genie," it consists of an aluminum shaft furnished with a length of strong, lightweight nylon line. Rate of descent is determined by the number of times the line is turned around the shaft and by the weight of the person or object lowered. According to the manufacturer the unit is tested to a minimum of 1,500 pounds and is available with 20, 50, 100, 150 or 200 foot lines.

The complete unit weighs less than 1 pound and measures 9 inches in length, 2 inches in diameter. For details write the manufacturer.

Question: What is meant by a proof pressure test of fire hose and how does this differ from burst tests?

Answer: See Paragraphs A-52 and A-53 of NFPA Standard 196, Standard for Fire Hose, 1960 edition.

FIREMEN!

INCREASE YOUR INCOME!

Convert your spare time into steady income selling most popular line of Belts and Buckles with Fireman's personal initials, first name or nickname with miniature replicas of actual fire equipment beautifully enameled, also lapels, tie clasps, key chains, money clips, and cuff links. Excellent repeat business. We furnish you with FREE complete sales kit. Really nice part-time money producing items.

NO INVESTMENT NECESSARY!

For full particulars, write to

HOOK-FAST SPECIALTIES, INC.

Factory — 16 Eudora St.
P.O. Box 1088F Providence, R. I.

Now! Ice-Pak any injury in just 2 seconds!

Remarkable new discovery! ***NEW KWIK-KOLD INSTANT ICE-PAK. Gives instant cold that lasts up to ½ hour! For sprains, swelling, bruises and minor bleeding. Helps minimize injury, speed recovery.***

Doctors know that prompt application of cold is one of the most important first aid treatments for injury. And *how fast* cold is applied can often make the difference between days, and even weeks, of recuperation.

Now a new scientific discovery called KWIK-KOLD makes it possible for anyone—anywhere—to get the medical benefits of cold in a hurry!

New KWIK-KOLD Instant Ice-Pak gives you *instant cold* for any injury. Relieves pain on the spot—reduces swelling and minor bleeding. Much faster and handier to use than old-fashioned ice bags and, unlike ice, is always available, is not messy, is easy to carry on trips.

Quick and easy to apply. Just squeeze the plastic bag and—in just 2 seconds—you get instant cold that *stays cold* up to half an hour! The tough yet flexible plastic bag conforms readily to body contours. Non-toxic and safe, even if the bag is punctured. Keeps for extended periods of time.

Kwik-Kold provides ready relief for athletic injuries. Used by the 1960 U.S. Olympic Team, Kwik-Kold should be standard equipment for all football, basketball, and baseball teams as well as other athletic groups. For all sports injuries—sprains, black eyes, cuts and bruises—Kwik-Kold is handy and effective, indoors, outdoors, in all seasons.

New KWIK-KOLD belongs in the first aid kit of everyone who has to deal with sudden injuries. Get Kwik-Kold from your local first aid equipment supplier or write International Latex Corporation, 350 Fifth Avenue, New York 1, N. Y.

Kwik-Kold can be stored at any temperature, always ready for immediate use. Tough yet flexible plastic bag contains dry Cold-Crystals and an inner pouch of special fluid. When you squeeze bag, fluid is released to activate crystals and give *instant cold*. Apply as you would an ice pack. Bag measures 6" x 9", conforms smoothly to body contours, is not lumpy, messy, or drippy. Dispose of bag after use.

How Cold Works in the Treatment of Injuries:

Cold is medically recognized for its value in the treatment of various injuries. In *minor bleeding*, cold has an astringent action on tissues and constricts capillaries, thus acts to reduce blood flow at the site of the wound. By reducing effusion of blood to wound, cold helps reduce *swelling, inflammation, and discoloration* in bruises and sprains. The local anesthetic effect of cold helps *relieve pain.* And because it restricts blood flow to and from the wound, cold slows spread of venom in treating *insect and snake bites.*

How To Use Cold in Emergency First Aid:

Sprains. Elevate injured part to a comfortable position. *Apply cold packs* to sprain to ease swelling and relieve pain.

Bruises, Black Eyes. Apply cold pack promptly to bruise for 20 to 25 minutes. Cold inhibits flow of blood to wound, helps limit discoloration, reduce swelling and pain.

Bleeding. In bleeding from the nose, the head should be kept erect, as lowering the head tends to encourage continued flow of blood. *Apply cold* to the nose, and if the bleeding is from near the tip of nose, pinch the nostrils together for a few minutes. In bleeding from cuts and abrasions, keep the area raised and *apply cold* in conjunction with other prescribed treatment.

Insect & Snake Bite: *For bee, wasp and hornet stings,* remove stinger with sterilized needle or knife point. *Apply cold* to sting to relieve pain and slow absorption of venom. Apply calamine lotion to relieve itching. *For ant, chigger and mosquito bites,* wash affected parts with soap and water, then apply paste of baking soda. *Apply cold* to reduce swelling. *For snake bite,* follow prescribed first aid procedure, *using cold* application on wound to relieve pain and help limit spread of venom.

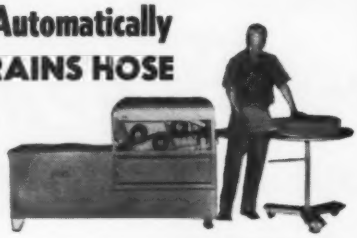
Sunstroke. For mild sunstroke (marked by headache, fatigue, dizziness and, perhaps, fainting), cool patient off quickly. *Apply cold packs* to head to help lower body temperature.

Minor Burns. Follow recommended first aid procedures to exclude air from burned area and prevent contamination. *Apply cold packs* to relieve pain.

Other Uses. Cold packs may be considered for use in conjunction with other appropriate first aid measures in treating minor head injuries, suspected appendicitis, headache and fever, toothache, and fainting.

Roto-Jet Hose Washer Automatically
WASHES – RINSES – DRAINS HOSE

ROTO-JET Washes, Rinses, Drains hose thoroughly and quickly. Hose is self-propelled. Simple one-man operation. With or without detergents, ashes, glass and sludge are automatically scrubbed out and flushed away. Lengthens hose life. Foot-Pedal Operation.



CIRCUL-AIR

FIRE HOSE DRYER

The patented, electrically operated Circul-Air hose dryer circulates pre-warmed fresh air through loosely coiled hose at the rate of 5 to 6 air changes per minute. No other drying method is so fast — so economical — so easy to use. The preferred dryer in over 6,000 leading Fire Departments.

ACCEPTED — APPROVED RECOMMENDED

Approved by Underwriters' Laboratories . . . and Canadian Standards Association. Recommended by all leading fire hose manufacturers.

THE CIRCUL-AIR CORPORATION 565 EAST MILWAUKEE DETROIT 2, MICHIGAN

FINALLY...

THE FIREMAN'S DREAM COMES TRUE!

SCHULTZ'S "A.P.T." TOOL

One Compact Tool with 27 Uses

WEIGHT — under 5 lbs. LENGTH — 18 inches
CHROME FINISH SOLID #4140 SPECIAL STEEL ALLOY
FORM-FITTING HAND GRIP — SAFETY THONG

Sold by Leading Fire Department Dealers Everywhere
— Ask to see it! —

SCHULTZ'S A.P.T. (all-purpose tool) was designed and made for firemen by a fireman with 30 years' experience. Here is an easy to carry axe, pick, shingle ripper, nail puller, door opener, window opener, hydrant wrench, spanner wrench, gas, oil tank and water shut-off key, hammer, battering ram, pinch or crowbar — you'll find many more uses, too! See it — use it — and you'll want SCHULTZ'S A.P.T. for squadmen, pipemen, laddermen, motor engineers and officers.

WRITE FOR FREE DESCRIPTIVE LITERATURE

SCHULTZ'S A.P.T., 2601 ZINOW AVENUE, DETROIT 12, MICHIGAN

Dickinson City Chief

ON JULY 1 of this year A. P. "Tony" Putschler became the first full-time fire chief of the Dickinson, North Dakota, Fire Department. Chief Putschler first became a member of the department in 1939 and for three terms he had been elected chief by the volunteers. His appointment is the first step in a five-year development program initiated by Dickinson's Fire and Police Commissioner Robert E. Baird, which eventually will bring additional full-time paid fire fighters to the department.

With 33 years' experience in the fire service, Chief Putschler also is trustee of the North Dakota Firemen's Association, state vice president of the Missouri Valley Association of Fire Chiefs and a member of the International Fire Service Training Association.

Window Display

THE following has been suggested as a window display for possible use by fire departments to stress the principles of fire prevention:

1. Create a living room scene with upholstered sofa and chairs, rug on the floor, floor lamps, an end table and other items. *However,* use items which have been burned in actual fires, such as scorched rugs, partly burned drapes or curtains, damaged furniture.

2. Place showcards with arrows pointing to point of origin and explaining why fire started, perhaps by a smoldering cigarette dropped into upholstered furniture, overflowing ash tray which allowed cigarette to drop on rug, matches left within reach of children which started curtain fire, etc.

3. Use a larger sign to include the latest NFPA figures on fires caused by smoking and matches, plus the slogan "Don't Give Fire a Place to Start."

Identify Yourself!

Use our molded plastic name plates on your car. Standard design reads

"FIRE DEPT. — RANK"

65c single — $1.25 pair.

White plastic base with lettering in fire engine red.

Special signs with name of town and **"FIRE DEPT."** — 50 minimum for $47.50 and 100 for $80.00.

See your dealer today, or write to

E. B. LANE
32 Greenwood Ave., Toledo 5, Ohio

Original Manufacturer of Aluminum Ladders

ALCO-LITE

aluminum ladders are standard equipment on these trucks

An Alco-Lite 14′ Pumper Roof Ladder and 24′ Pumper Extension Ladder on a 900 Series American LaFrance Pumper.

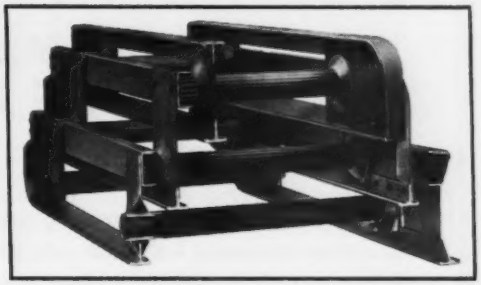
An Alco-Lite 14′ Pumper Roof Ladder and 35′ Pumper Extension Ladder on a 900 Series American LaFrance Pumper.

This typical nesting of Alco-Lite Ladders on American LaFrance Aerials includes a 24′ Pumper Extension Ladder, 20′ Straight Ladder; 35′ Heavy Duty Extension Ladder, 28′ Pumper Extension Ladder; 16′ Pumper Roof Ladder, 35′ Heavy Duty Extension Ladder, and 50′ Heavy Duty 3 Section Extension Ladder.

Alco-Lite Aluminum Ground Ladders are lighter weight . . . easier-to-handle . . . safe. Exclusive gusset plate, expansion bushing construction makes possible the open side rail,T-channel design. Excess weight adding bulk in the side rails is eliminated. More than meet all current tests for strength and safety.

Alco-Lite Aluminum Ladders are unaffected by moisture, water, fumes, gases. Won't warp, rust, rot, splinter, or burn. Almost maintenance free!

Rungs won't twist, turn, or break off. Feature non-slip type corrugations.



Channel slides prevent sections from disengaging. On large ladders, automatic spring loaded locks allow sections to extend, lock, and unlock simultaneously.

Aluminum Ladder Company ALCO-LITE

FLORENCE S. CAROLINA

CAIRNS HELMETS

IN TOP-GRAIN LEATHER

No. 5A
The "NEW YORKER"
(REGULATION)

Three other models in leather available, in both regulation and drop brim styles.

IN ONE-PIECE ALUMINUM

No. 350
The "SENATOR"
(REGULATION)

Also available in aluminum, in streamlined drop brim patterns.

IN "FLINT-FLEX" PLASTIC

No. 900
The "CLIFTON"
(REGULATION)

Other approved styles in plastic are described in our catalog.

THE FIREMAN'S FIRST LINE OF DEFENSE

The manufacture of Fire Helmets has been our EXCLUSIVE business for one hundred twenty-five years. Today we are the ONLY manufacturer offering you your choice of helmets in leather, aluminum, or plastic — all of them veterans of fire service — all produced in our own modern factory — and all distinguished by those high standards of design, materials and craftsmanship for which the name CAIRNS stands throughout the fire-fighting world.

Write for Catalog 360

CAIRNS & BRO., Inc. — Allwood, Clifton, N. J.

SINCE 1836

ULC Standard

UNDERWRITERS' Laboratories of Canada has published a Second Edition of its Standard for Unlined Fire Hose, Subject C18. The new edition features revisions concerning leakage test requirements under the heading of "Hydrostatic Tests" as well as other changes. Copies can be obtained on request from Underwriters' Laboratories of Canada, 7 Crouse Road, Scarborough, Ontario.

General Mix-up

From the Associated Press. — Four long-dead Confederate generals are threatening to give Mechanicsville, Virginia, firemen a splitting headache.

The foursome: Generals Robert E. Lee, Stonewall Jackson, A. P. Hill and D. H. Hill.

So far as the firemen are concerned, it's all right for the townsfolk to honor the esteemed generals, but they've overdone it.

There's a Jackson Avenue in Mechanicsville, a Jackson Road and a Jackson Boulevard.

There's a Lee Avenue and a Lee Boulevard.

Also, there are two Hill Streets, each named after one of the Generals Hill.

"I have all the respect in the world for Jackson and Lee," said fireman Ed Cox. "But some night somebody's house is going to burn down around here because of those street names."

Other firemen agreed that someday they'll end up going to the wrong place in answering a fire call because of the commemorative street names.

We suppose that for situations like this, it would be taken for Granted that firemen could respond to alarms in Sherman tanks, but undoubtedly someone would Pickett their operations! — Ed.

"Let's just say you put too much color in your description of the fire."

NEW 76 PAGE
FIRE PROTECTION EQUIPMENT
CATALOG

Chances are you haven't seen this big, new catalog yet—but if fire protection equipment is under your supervision, we're certain you will want a copy on file. Industrial as well as municipal equipment is carefully detailed. Large illustrations, crisp descriptions and fact filled charts for easy reference. Catalog also features—valves, hose house equipment, couplings, expanders, wrenches, cabinets. *Write for your copy today.*

Booths 100 and 117 I.A.F.C.

ELKHART BRASS MFG. CO., INC.
Elkhart, Indiana
More than half a century of fire fighting progress

MAIL COUPON TODAY

ELKHART BRASS MFG. CO., INC., ELKHART, IND.
Be sure to send Elkhart's New Catalog J at once:

Attention Of:_____
Firm_____
Street_____
City_____ Zone____
State_____

Answer to "WHAT IS IT?"

The circles on page 45 represent the standard sizes of nozzle tips with which all fire fighters should be familiar. The tips range from ¼-inch diameter to 2-inch diameter.

Flows and recommended nozzle pressures for these tip sizes are:

Diameter (Inches)	Nozzle Gallons per Minute (U.S.)	Pressure	Fire Ground Figures — GPM
¼	12	45	12
⅜	28	45	30
½	49	45	50
⅝	76	45	75
¾	111	45	120
⅞	150	45	150
1	198	45	200
1⅛	251	45	251
1¼	413	80	400
1⅜	500	80	500
1½	596	80	600
1⅝	700	80	700
1¾	813	80	800
2	1,063	80	1,000

Fire Department Mechanics

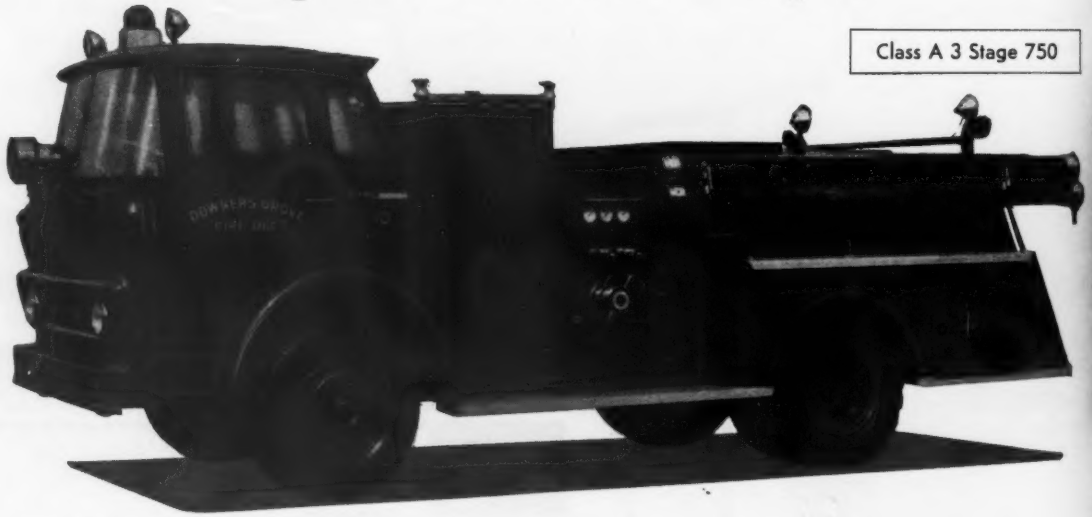
RECENTLY formed in Florida was an association of fire department mechanics representing departments from all over the state. At present the organization has 36 members including William H. Barnett, Superintendent of the Florida State College.

Present officers of the Fire Department Mechanics of Florida are: Norman C. Hout, Fort Lauderdale, president; H. Paul Reed, Tampa, vice president; Charles Pritchard, Sarasota, secretary, and C. R. Outlaw, Lakeland, treasurer.

California Champs!

The Kern County Fire Department won first honors in hose laying and pump evolution competition during the California Rural Firemen's State Convention. The meeting, held in San Jose, drew competing fire department teams from all parts of California. Team above scored a winning time of 1 minute, 29 seconds. Left to right: Engineer Byron Kennedy, Captain Jack Chambers, Engineer Larry Dunivent and Fireman Orville Werling.

Let the Proved Satisfaction of Downers Grove* Help You Select a New Champion



*Downers Grove, Illinois (their fifth Champion)

W. S. Darley & Co., Chicago 12

ESTABLISHED 1908

Look, Chief! Carrying 50 feet of "EZflex" is easy! I could hardly budge that old cotton rubber lined!

"EZflex"... the Modern Fire Hose. Half the Weight—Half the Bulk of Conventional Cotton Rubber Lined. 300 Lb. Test, S.J.—400 Lb. Test, D.J. 50 Ft., 75 Ft. and 100 Ft. Lengths.

Manufacturers of Mechanical Rubber Products — Since 1870

Standard of Quality HOSE · BELTING · FOOTWEAR
CLOTHING · EXPANSION JOINTS · PACKINGS · LINERS, ETC.

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches and Distributors Throughout the United States and in Canada

FIRE SERVICE MEETINGS

California:
SEPTEMBER 21: Monterey Bay Area Fire Chiefs' Association, quarterly meeting. Contact Walter Streuli, secretary, Box 243, Gonzales.

Colorado:
SEPTEMBER 29: Western Valley Firemen's Association, quarterly meeting. Contact Joe Brady, secretary, Grand Junction.

Delaware:
SEPTEMBER 25: Del-Mar-Va Volunteer Firemen's Association, Rev. Thomas C. Mulligan Day, 4:00 P.M., Georgetown. Contact H. A. Golt, president, Dover.

Missouri:
SEPTEMBER 22: West Central Missouri Firemen's Association, Inc., regular meeting, Parkville. Contact Reuben Pemberton, secretary, Smithville.

Nevada:
SEPTEMBER 25: Ohio Caucus of International Association of Fire Chiefs, Riviera Hotel, Las Vegas, luncheon and meeting at 11:30 A.M. Contact Chief Fred Lange, president, East Cleveland, Ohio.

SEPTEMBER 25: Great Lakes Division of International Association of Fire Chiefs, annual meeting, Riviera Hotel, Las Vegas, 2:30 P.M. Contact Chief C. M. Williams, president, St. Louis Park, Minnesota.

SEPTEMBER 25: Missouri Valley Association, Division of International Association of Fire Chiefs, Sahara Hotel, Las Vegas.

SEPTEMBER 25: Pacific Coast Inter-Mountain Association, Division of International Association of Fire Chiefs, Sahara Hotel, Las Vegas, Host Chief, C. D. Williams.

SEPTEMBER 25–28: International Association of Fire Chiefs, 88th Annual Conference, Sahara Hotel Headquarters, Las Vegas. Contact B. Richter Townsend, Executive Director, IAFC, 232 Madison Avenue, New York 16, New York.

New Jersey:
SEPTEMBER 21: Gloucester County Firemen's Association, regular meeting, Verga. Contact Walter H. Mattson, secretary, 29 Home Avenue, Gibbstown.

New York:
SEPTEMBER 18: Chenango County Firemen's Association, Inc., Edmeston. Contact Clarence J. Gardner, Jr., secretary, Mount Upton.

North Carolina:
SEPTEMBER 19: Roanoke Firemen's Association, regular meeting, Jackson Fire Department. Contact George R. Ivey, secretary, Enfield.

Ohio:
SEPTEMBER 21: North Central Firemen's Association, regular meeting, 8:00 P.M. Sheffield Village, Lorain. Contact Eugene R. Woods, secretary, 332 South Main Street, Amherst.

SEPTEMBER 28: Stark County Firemen's Association, Inc., regular meeting, Navarre. Contact Gene Kay, secretary, 2036 29th Street, N.E., Canton 5.

Oregon:
SEPTEMBER 18: Clackamas County Firemen's Association, regular meeting. Contact Walter Wickline, secretary, 2137 S.E. 5th Avenue, West Linn.

SEPTEMBER 20: Central Willamette Fire Fighters' Association, regular meeting. Contact E. J. Bell, secretary, Stayton.

SEPTEMBER 20: Washington and Columbia County Firemen's Association, regular meeting, Clatskanie. Contact Captain Joseph J. Kust, secretary, 12930 N.W. Cornell Road, Portland 10.

SEPTEMBER 22: Polk-Yamhill Firemen's Association, regular meeting, Independence. Contact Glenn Wick, secretary, 209 Hayter Street, Dallas.

Rhode Island:
SEPTEMBER 27: Pawtuxet Valley Firemen's League, regular meeting, Washington Volunteer Fire Co., Inc. Contact Everett F. Fiske, secretary, 34 Pleasant Street, West Warwick.

PLECTRON

RADIO TONE ALERTING SYSTEMS

save time, lives and property!

When split seconds count a TONE activated receiver in his home, office or shop assures each fireman of receiving alarm messages in a prompt, efficient manner.

WITH PLECTRON TONE ACTIVATED RECEIVERS, you get these EXTRA advantages at no extra cost:

- **AUTOMATIC OR MANUAL RESET** . . . User selects either operation
- **ADJUSTABLE TIME DELAY** . . . "Live" time can be adjusted from 20/90 seconds
- **REMOTE SPEAKER OUTLET** . . . To connect remote speakers in other areas up to 300 feet

and now . . .

PLECTRON FACE SHIELD

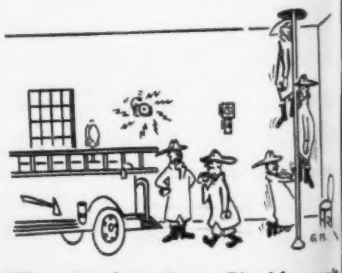
For protection against: HEAT; SMOKE; WATER; FLYING EMBERS; DEBRIS; WIND; RAIN; DUST; SNOW

Complete protection, yet lightweight, easily installed, swings out of the way and has excellent optical qualities, unrestricted vision.

NEW fully automatic TONE GENERATOR

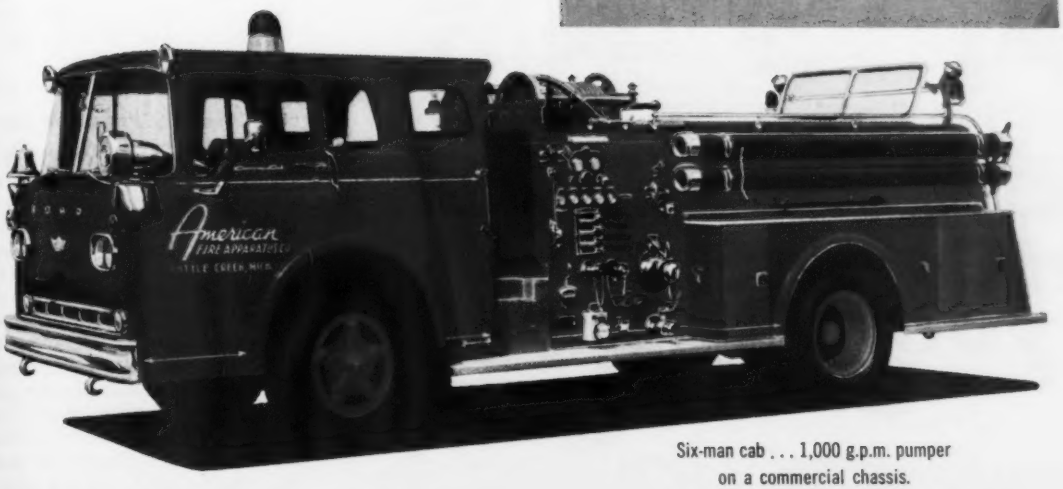
- Transformer powered
- Intermittent tone
- Monitor speaker
- Timed Tone Cycle

Designed and Manufactured by
PLECTRON CORPORATION
Overton, Nebraska



"For the last time, Finchlee, quit eating oranges around here!"

NEW...
from AMERICAN
FIRE APPARATUS...



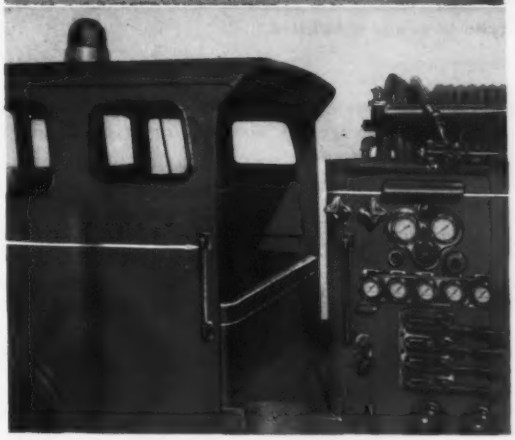
Six-man cab . . . 1,000 g.p.m. pumper
on a commercial chassis.

SIX-MAN CAB on a commercial chassis

Now, for the first time, you can get a spacious six-man cab on a commercial chassis. You get advantages never before offered, even in custom-built trucks. Here is truly fine engineering and craftsmanship, so typical of *American* Fire Apparatus. It is another example of how *American* helps make your fire-fighting job easier and increases your efficiency.

- Firemen can get out of either side of the broad rear seat — straight-through unobstructed passage from one side of the truck to the other.
- Sliding window permits easy communication between front and rear seats.
- Front and rear portions of cab are constructed as a single rugged unit.
- Rear section of cab has its own dome light.
- Side windows of safety plate glass are mounted in heavy rubber seals.
- Entire cab tilts forward, providing ready access to engine.

Wide comfortable seat, ample headroom, straight-through passage with no obstructions.



For complete details about this new six-man cab, see your nearest **American** representative.

American
FIRE APPARATUS CO.

Main Office: Main Street Rd., Battle Creek, Mich. Plants at: BATTLE CREEK, MICH., MARSHALLTOWN, IA., STRATFORD, ONT.

FOL-DA-TANK for ADEQUATE WATER SUPPLY

FAST . . . EFFICIENT . . . SAVES MONEY . . .

One Fol-Da-Tank plus your present tanker gives you same potential as two tankers — important where water supply is miles from scene of fire.

1 Unloaded and set up in less than a minute.

2 Two men easily open — tanker fills Fol-Da-Tank.

3 While pumper drafts, tanker brings additional water.

4 Fire out, emptied and ready to reload — nothing left behind.

Consult your nearest dealer or write:

FOL-DA-TANK CO., Box 361, Rock Island, Illinois

HOW IS *your* OLD SIREN ?

. . . is it tired and worn?

maybe it should be retired!

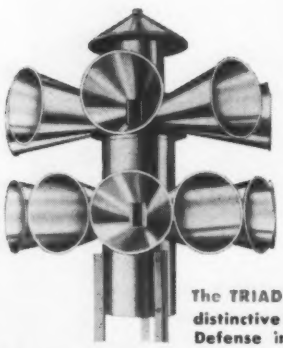
. . . will it survive another rough season?

maybe it needs a helper!

. . . have you outgrown it?

Every town has grown . . . residential areas have expanded— vacant lots are no longer "vacant"—larger buildings have replaced smaller ones—

Trees have grown larger with the years—
Busier streets are noisier—
Car radios drown outside sounds—
TV sets raise noise levels—
Homes are better insulated—
. . . all this makes ***your aging siren ineffective!***



FEDERAL has *new, more powerful sirens* to supplement or replace the inadequate, unreliable or worn out siren.

WRITE *TODAY* for FEDERAL Catalog #200 for Fire Sirens or Bulletin #36 for Civil Defense systems.

The TRIAD model 3T22 by FEDERAL. It provides a third distinctive signal for fire, in addition to the prescribed Civil Defense indications. *Eligible for OCDM matching funds!*

FEDERAL SIGNAL SIGN and Corporation

13617 S. WESTERN AV., BLUE ISLAND, ILL.

New Chief for Imperial Beach

CLARENCE L. GISH has been appointed chief of the Imperial Beach, California, Fire Department. He succeeds Volunteer Fire Chief W. A. Hague. Gish joined the department in 1949, became a lieutenant in 1957, and assistant chief in 1959. He will be the city's first full-time fire chief.

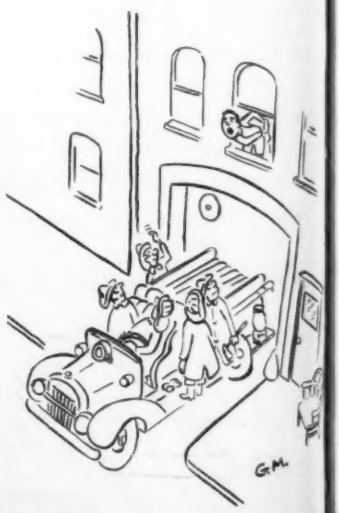
Safety Program for Kentucky Schools

TEACHING Kentucky school teachers, principals, superintendents, board members and custodians how they can operate their schools so that fires get small chance to start is the job of Warren Southworth, Chief Inspector, Division of Fire Prevention, Kentucky Department of Public Safety in Frankfurt.

In the past year Southworth has traveled more than 20,000 miles to visit school systems, from Bardwell in the west to Hazard in the east. He tries to reach every group which is immediately concerned with school fire safety.

Using a scale model of a school and display materials, he demonstrates how fires start from common causes such as defective furnaces and the misuse of electricity.

Results of this approach to school fire prevention are encouraging, according to Major Harold L. Foster, Director of the Division of Fire Prevention. The Pulaski County school system, where the first of the new programs was presented last July, was reinspected a few months later. Hazardous conditions had been reduced by 50 per cent.



"Don't wait for me . . . I'll grab a taxi."

AN ANNOUNCEMENT OF IMPORTANCE TO PROGRESSIVE FIRE CHIEFS

Akron Brass will introduce at the I.A.F.C. Convention in Las Vegas, a new line of wyes, siamese, and valves.

We believe this is an event of real importance to the fire service for the following reasons.

1. All valves will be full flow, ball valves. This means that wherever you have a 2-1/2" valve it will have a full 2-1/2" passage through the ball.

2. The material used will be "Pyrolite."* This means greater strength, no corrosion, one-third the weight.

3. Last and most important — all valves will have the new "TORK-LOK"* control. "TORK-LOK"* gets rid of locks on handles forever. It gives the operator full control of the water stream. Set your handle in any position — it will stay there, until you change it. No more will water pressure or vibration slam your ball valve open or shut when you choke a stream. You have to see "TORK-LOK"* to believe it. Your handle will turn easily — but only when you turn it.

These are the new features. In addition, all items in the "Pyrolite"* line will operate freely at 500 pounds pressure, will hold 1,000 pounds pressure, have fixed balls, flanged construction and adjustable seals.

We believe this is the finest equipment ever offered to the fire service. We cordially invite you to see for yourself at the Akron Brass exhibit in Las Vegas.

Sincerely,

Ray J. Kubec, President
Akron Mfg. (Canada) Ltd.

J. E. Fishelson, President
Akron Brass Mfg. Company, Inc.

*"TORK-LOK" and "Pyrolite" trademarks and patents applied for.

Initial items to be offered in the "Pyrolite"* line, with "TORK-LOK"* controls are:

2-1/2" x 1-1/2" x 1-1/2" Ball Valve Wyes

2-1/2" to 6" x 2-1/2" x 2-1/2" Ball Valve Hydrant Wyes and Siamese

2-1/2" x 1-1/2" x 2-1/2" x 1-1/2" Water Thief

All Akron Brass items using ball valves 1-1/2" or larger, and all Akron valves 1-1/2" or larger, will have the "TORK-LOK"* control.

AKRON BRASS MFG. CO., INC.
WOOSTER, OHIO

AKRON BRASS
FIRE FIGHTING EQUIPMENT

AKRON MFG. (CANADA) LTD.
AYLMER, ONTARIO

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SPECIFY...

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ELECTRIC TACHOMETERS

There's *No Doubt* about it . . . when it comes to Dependable . . . Rugged . . . Accurate tachometer performance . . . SUN Electric Tachometers give you the steady R.P.M. readings you need to assure fire killing water pressures, protected pump and engine life and efficiency.

NEW
MODEL FZ
99% ACCURATE

One-piece electronic Zener tachometer—up to 5000 R.P.M. Transmitting unit has no moving parts or variable resistors.

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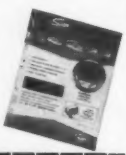

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TACHOMETER DIVISION
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Please send me Model FZ catalog and price information.

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☐ Equipment Distributor
☐ Fire Equipment Mfgr.

Name_____
Address_____
City_____ State_____

182

LETTERS TO *FIREMEN*

Mr. Chester I. Babcock
Asst. Technical Secretary, NFPA

Dear Sir:

Your article in the June, 1961 issue of FIREMEN magazine regarding swimming pool fires has prompted us to bring to your attention a hazardous situation that existed in our schools brought about by the indiscriminate use of calcium hypochlorite.

Briefly, the problem arose due to the fact that school custodians were using calcium hypochlorite mixed with cold water and sawdust to clean up after children had become ill and vomited. The resulting material became very dangerous and generated heat and could have caused a fire.

We learned that this chemical can be extremely hazardous if it is not properly used. The wetting of the granules will cause a condition of rapid decomposition or breakdown of this product that generated heat. If this generation is not removed from the product, it will build up to a point where a fire could develop. It must be kept in mind that as a product breaks down, oxygen is produced which feeds and makes better combustion in any fire. Once the rapid decomposition of the chemical begins, it is practically impossible to stop except by total immersion of the product in water.

If the sawdust has been treated with any oil or other organic material, this alone, when mixed with calcium hypochlorite, could cause spontaneous decomposition and initiate combustion.

For these reasons, a manufacturer consulted by this department did not recommend mixing calcium hypochlorite with sawdust. If both materials are to be used, they recommend that sawdust be used by itself and then if the area is to be disinfected, it should be mopped with a hypochlorite solution.

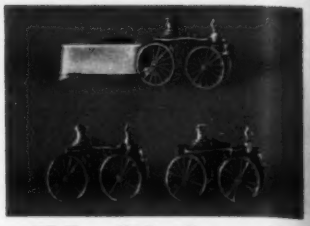
Needless to say, we have corrected the situation that existed in our schools, but felt that this information might be useful to other departments who may experience the same problem.

YOURS FOR BETTER FIRE PREVENTION,

Battalion Chief Verlyn P. Mack
Chief Inspector
Bureau of Fire Prevention
Hammond, Indiana, Fire Department

(*Continued on page 68*)

The Symbol of Fire Fighters



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Plus 10% Federal Excise Tax
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How You Can Build and Use...
"TABLE-TOP" FIRE PREVENTION DEMONSTRATION KITS
By
Captain Ira A. Anderson
Fire Prevention Officer
Rialto Fire Department, Rialto, California

A complete, illustrated manual on the design, construction, wiring circuits, and use of equipment and apparatus for "TABLE-TOP" DEMONSTRATIONS of Fire Safety and Fire Prevention. Also contains a SIX-THOUSAND WORD LECTURE TO ACCOMPANY THESE DEMONSTRATIONS! This is the book from which the article featured in the February 1960 issue of FIREMEN Magazine was taken!!! The information in this manual will develop your "PUBLIC RELATIONS PROGRAM" to an all-time high!!!

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per copy Postpaid
in the United States
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A new, light-weight, compact, powerful speaking device, comprising the most up-to-date electronic components. The ability to communicate clearly while wearing mask equipment makes possible the exchange of needed information and instructions for greater safety. The VOICE-PAK inspires confidence and the increased safety builds morale.

VOICE-PAK operates on inexpensive, pen-light batteries available everywhere. Speaker is protected by a strong, water-resistant, metal case. The complete assembly, including Scottoramic mask with nosecup, can be used with all Scott Air-Paks.

Designed for use with protective breathing equipment

Write for brochure giving complete technical data.

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SPARKY
Talks, Moves Head and Mouth
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Delivers your Fire Prevention message by recording and by hidden mike — automatically or by remote control.

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Dramatically effective training aid for schools, fairs, demonstrations, campaigns and public showings the year around.

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Clean-cut, clear, white Register Bond (15# Sulfite) in standard 6" rolls delivered from stock.

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We also make the versatile Air Tool — Emergency Rescue Kit — Glass Blocksmasher
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9148 OVERHOOD

- Aluminized Glass Cloth
- 180° arc of vision
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The 9148 snaps quickly and easily on to the brim of any fire helmet—gives excellent radiant heat protection to face, neck, chest and shoulders. Breathing apparatus can be worn beneath hood. The face piece, frame and drape are all detachable for easy part replacement.

Write for details on Fyrepel's complete line of fire fighting clothing and equipment.

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BRAXMAR BADGES

1879 — 1961

Choose from hundreds of designs in nickel, rhodium, sterling silver, gold plate, permaglo, gold filled and 14 kt. gold. Complete satisfaction assured by one of America's oldest badge manufacturers.

SEND FOR NEW CATALOG No. 82

The C. G. Braxmar Co., Inc.
Dept. F 216 East 45th Street
New York 17, New York

Letters (*continued*)

Dear Sir:

Reading the article in your April number, titled "Speeding the Attack with Supply Lines and Master Streams," reminds me that the same technique, with certain modifications for local conditions, is standard practice in Europe, England and Australia, to name three spots.

The answer seems to be manpower.

When more water lines are needed, they first hook an extra line to a pumper already in position and call for help only when the capacity of pumps at the fire ground has been exceeded. Most overseas pieces respond with enough men to supply at least two nozzle crews, while extra men from trucks and squad cars can man a third. Thus they figure at least 3 streams per pumper.

A recent fire in a movie house in Perth, W. Australia, was handled by six companies, although by our standards it was a 3-alarm job. A similar fire in Copenhagen, Denmark, used 8 lines from two pumpers. You will find a comparable situation in France — indeed, in Europe, it is an exceptional fire that needs more than 4 pumps.

The end result is that there is less clutter at the fire ground, and while one will see as much "spaghetti" as at a 3-alarm worker in this country, there won't be the same amount of apparatus in the streets to get in everybody's way.

Yours sincerely,
Southworth Lancaster

Great Lakes Box 15 Club To Host Chiefs at Las Vegas

BOX 15, the equipment suppliers' club from the Great Lakes Division, will again host fire chiefs of the Division and their wives at the IAFC Conference in Las Vegas. This annual cocktail-dancing party will be held at the Riviera Hotel, Las Vegas, on Monday night, September 25, at 8:30 P.M. Admission will be by ticket only, these to be distributed to Great Lakes Chiefs by Box 15 Club members at the annual meeting of the Division earlier that day.

Box 15 re-elected officers for 1961 are C. T. McGraw, Circul-Air, president; "Stu" Spalding, Eureka Fire Hose, vice president; Fred Fischl, Bi-Lateral Fire Hose, treasurer; and Grace Clark, Circul-Air, secretary. Directors include Lloyd Schafer, Gamewell; Willis Barton, for American Fire Apparatus and Fabric Fire Hose, and "Spud" Van Gorp, Seagrave.

REACH! — 55′ and 65′ three-section steel and aluminum ladder; 75′ and 85′ three or four-section all steel ladder.

MUSCLE! — hydraulic pump driven by power take-off with emergency hand pump. Tested to 500 lbs. load fully extended in horizontal position.

MANEUVERABILITY! — ladder can be elevated to any angle from horizontal to vertical and rotated 360 degrees in either direction. Hydraulically operated stabilizers provide rapid placement and leveling.

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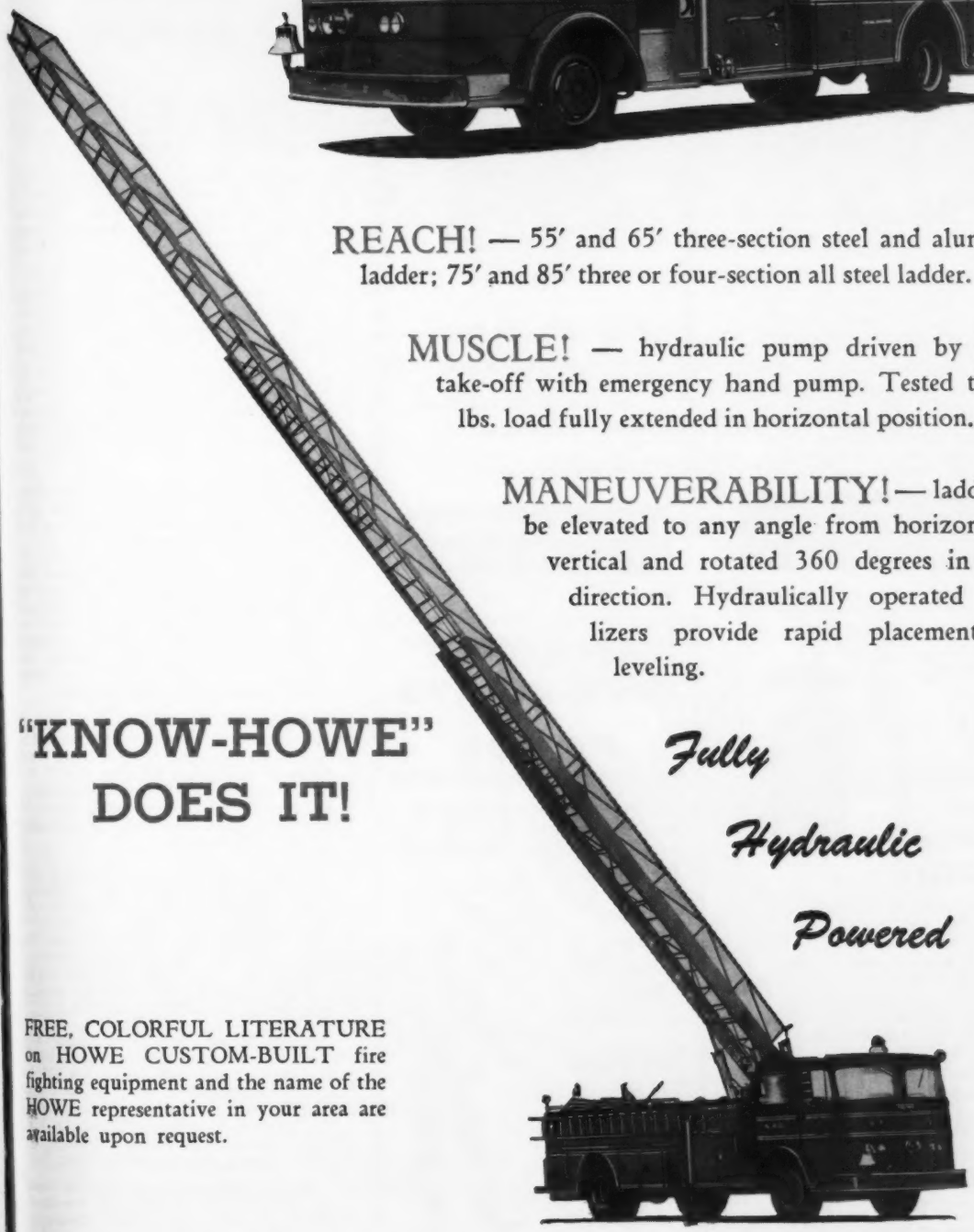

FREE, COLORFUL LITERATURE on HOWE CUSTOM-BUILT fire fighting equipment and the name of the HOWE representative in your area are available upon request.

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"dependable fire apparatus since 1872"

FIRE APPARATUS COMPANY

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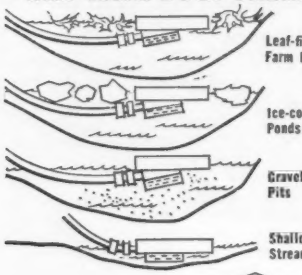
PUMP WATER ANYWHERE with FLOAT-DOCK STRAINER



ANYWHERE!

The amazing dual-use Float-Dock Strainer gives you clean pumping in deep or shallow water. No more sand, gravel or debris to enter your pump, wearing out impellers, packing and bearings. Actually saves you pump maintenance expense.

Strainer drafts from a few inches below surface where water is cleanest. Drafts down to about 5 inch depth *with no whirlpool* or *loss of suction.*

Strainer and float constructed of 16 gauge welded steel, cadmium plated. Coupling size, 2½" through 5".

Contact your distributor or write:
FOL-DA-TANK COMPANY
Box 361, Rock Island, Illinois, U. S. A.

NIELSEN-RIONDA BADGES

- Money Clips - All Badges - No Extra Charge
- 10 Year Guaranteed Hat & Coat Attachments
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Write for Free 32-Page Catalog to Dept. F9

NIELSEN • RIONDA Inc.
40 JOHN ST., NEW YORK 38, N. Y.

save life & property with New Model Falcon®

- Simple visual inspection with new sight glass—added neatness of design.

No one can place a price on the possible loss of lives due to fire. But Falcon Automatic Fire Alarms & Systems can give early warning of fire to protect lives and guard property.

Falcon Automatic Fire Alarms and Systems are:

- LISTED BY UL AND ULC for use with 600 ft. of ¼" aluminum tubing
- SELF-CONTAINED (No wires or batteries)
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. . . and they are low in cost!

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WRITE for particulars — and free, informative "Sounds for Safety" folder! Dept. FN

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"SPARKY" GIVE-AWAYS AND PRIZES FOR FIRE PREVENTION WEEK

"Sparky" give-aways will brighten up your fall Fire Prevention campaigns in schools and fire stations:

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BOX 444D WAYLAND, MASS.

Firemen's Training in the Months Ahead

Alabama: An Arson Investigation Conference is scheduled for October 30–November 3. Write W. L. Rickard, P.O. Box 2847, University.

Arizona: The 9th Annual Arizona Fire Training School will be held at Phoenix College, Phoenix, October 19–21. Contact Assistant Chief Jake Siken, director, Phoenix Fire Department, 49 South First Street, Phoenix 4.

Arkansas: Two-week regional training schools will be conducted through November 30. For details write W. A. Turner, Education Building, State Capitol, Little Rock.

Indiana: Purdue University will be the site for the 4th annual Fire Inspectors' Course, October 30–November 3. Contact Professor Shelby Gallien, Director, Public Safety Institute, Purdue University, Lafayette.

Kansas: The Kansas State Fire School will be held October 23–26. For details write Clyde A. Babb, Director, Kansas State Fire School, 111 Fraser, Lawrence.

New Jersey: The New Jersey State Fire College's training course for fire fighters will be held September 22–24 at the National Guard Training Center, Sea Girt, and an officers' training course will be conducted November 17–19 at Seaside Heights. For details, write the New Jersey State Safety Council, 24 Branford Place, Newark 2.

Oklahoma: The Seventh Annual Southwestern Arson Investigation Institute will be held at the Extension Study Center, North Campus, in Norman, October 17–21. For details write James Robinson, Coordinator and Legal Consultant, Southwest Center for Law Enforcement Education, The University of Oklahoma, Norman.

Ontario: The province of Ontario will conduct the following courses: Volunteer Fire Officers' Course Part I, September 18–22; Pump Course, September 25–October 6; Basic Fire Inspection Practices Course, October 16–20, and Mutual Fire Aid Forum — County Fire Co-ordinators, October 23–27. Contact D. E. Barrett, Director, Ontario Fire College, Box 830, Gravenhurst.

Rhode Island: The Third Annual Fire Academy conducted by the Rhode Island Firefighters Instructors Association will be held October 13–15 at the Newport Naval Training Station Firefighting School area. For details write Captain Michael J. Fox, State Supervisor of Firemen Training for Rhode Island, 903 Broadway, East Prov.

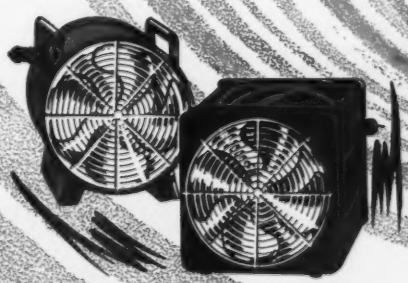
South Carolina: Itinerant training classes will be held each week through December. For details, write H. B. Wells, Instructor, Shady Springs, Rt. 1, Prosperity.

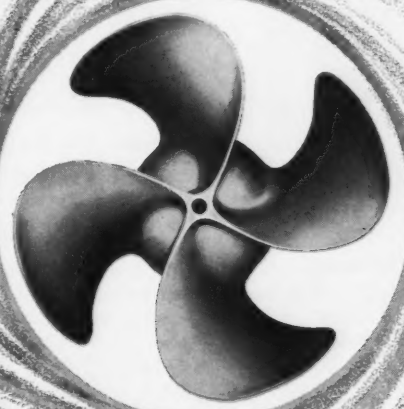
Virginia: A Peacetime Radiation Fire Instructors School (for approved fire instructors only) will be held November 27–December 1 at Richmond. For details write R. Lawrence Oliver, State Department Education, Trade & Industrial Service, P.O. Box 654, Harrisonburg.

You Get
Controlled Ventilation
with SUPER VAC Smoke Ejectors!

Super Vac Smoke Ejectors rid the area of smoke and fumes by the powerful vacuum action from specially designed blades. As a blower, Super Vacs force a tremendous blast of fresh air into the smoke-congested area to reduce combustion and asphyxiation dangers. Fire Departments throughout the United States and many foreign countries depend upon Super Vacs for controlled ventilation and smoke elimination. Don't gamble with safety. Try Super Vac dependable performance.

Write for your copy of the All New Super Vac OPERATIONAL MANUAL 61—just off the press (available at our convention booth).*





*See us in Las Vegas at the I.A.F.C. Convention Sept. 25-28 and register at our booth for FREE Smoke Ejector.

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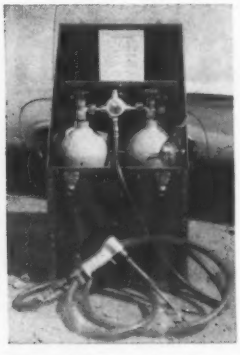

"Qwik Kut" to the Rescue

Trapped victims can't wait! This new, flameless, air-operated portable cutter gets them out fast. *Qwik Kut Manufacturing Company*, 83 Washington Street, Brookline 46, Massachusetts.

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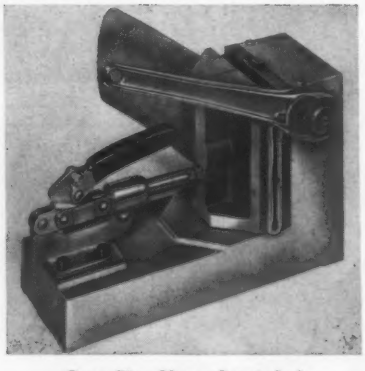

Cuts Fire Hose Straight!

The B & P "straight edge" hose cutter *safely* knifes a perfect 90 degree cut on cotton, rubber or Dacron hose. *Bell & Pihl Company*, 182F Broadway, Arlington 74, Massachusetts.

"A.P.T." Tool Has 27 Uses

The newest practical and compact fireman's tool is this 18-inch, less than 5 pounds, hardened steel alloy unit by *George Schultz*, 2601 Zinow Avenue, Detroit 12, Michigan.

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Indian Fire Pumps Improved

The famous No. 90 all brass Indian back-pack pump now provides greater ease and efficiency for fire fighters. Notice the new 18" telescope-handle pump and snap fastener on shoulder strap to keep arm free for action. A 90 degree angle brass elbow-hose outlet fitting on tank prevents hose from kinking. Write *D. B. Smith & Co.*, Utica 2, N. Y.

Identifies Boxes Day and Night!

Here's the new plastic, reflective material "Plazmark" to identify fire alarm boxes fast. Bright red, with reflective letters, it's fade resistant and weatherproof. Write *National Marker Corporation*, 222 Wampanoog Trail, East Providence 13, Rhode Island.

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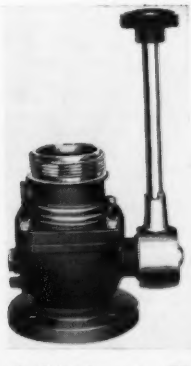

New Ball Valves by Elkhart

Completely new from inlet to outlet describes the suction, discharge and in-line ball valves recently introduced for motor fire apparatus by *Elkhart Brass Manufacturing Company, Inc.*, Elkhart, Indiana. Write for free illustrated folder.

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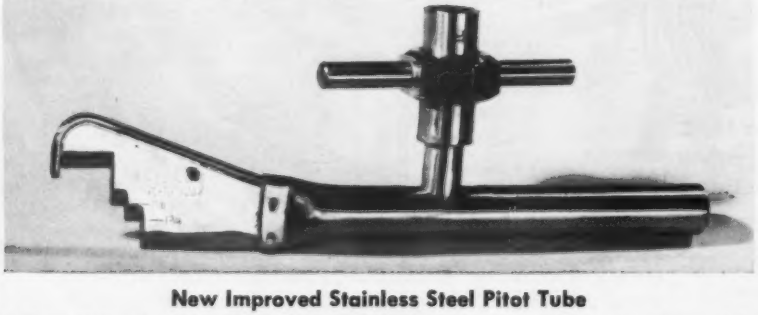

New Improved Stainless Steel Pitot Tube

A *Jones Laboratory*, P.O. Box 408, West Hartford 7, Connecticut, development for measuring flow of water from any orifice. Useful device for fire departments, industrial plants and fire protection engineers.

New Citizen's Band Transceiver

Mobilaire is the new mobile transceiver for Citizen's Band operators by *Browning Laboratories, Inc.*, Laconia, N. H.

. . . For the Ladies

Safety Glasses by Libbey

Available on special order are distinctive safety edge tumblers with fire prevention message. Write *Organization Services, Inc.*, 8259 Livernois, Detroit 4, Michigan.

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Firemen's Insignia Vu-Lighter

A colorful gift and a practical conversation piece for any fire fighter is this Scripto Firemen's Windguard Vu-Lighter at $3.95. Order from *FD Products*, Department F-25, 90-N1 Tracey Place, Englewood, New Jersey.

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Antique Fire Apparatus Prints

Roberts Company, Box 444D, Wayland, Massachusetts, offers sets of six different 7" x 9" four-color prints of antique apparatus, ideal for framing. A beautiful gift, $1.00 postpaid.

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Old Smokey Post Name Signs

A prized gift or award for any fire fighter is this 14" silhouette antique steamer design post name sign in cast aluminum. Indicate if for wood or steel post. Price $13.75 postpaid from *Roberts Company*.

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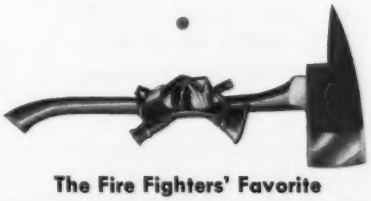

The Fire Fighters' Favorite

Crossed nozzle, horn and helmet design fire axe tie clasp in yellow gold and red finish. For young and old as "off-duty" dress. Price is $1.50. Write to *Hook-Fast Specialties, Inc.*, P. O. Box 1425F, Providence, Rhode Island.

Lovable "Sparky" Dolls

$5.95 each plus 60¢ shipping charge. Write to *Roberts Company*, Box 444D, Wayland, Massachusetts.

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A "happy SPARKY" in antique gold finish for collar, blouse or clothing ornament. Also used as lapel or tie-tack pin for men. $1.00 plus 10¢ postage — *Roberts Company*, Box 444D, Wayland, Mass.

Quality Leathercraft Gifts for Fire Fighters

Here is a wide selection of firemanic accessories for the home, birthdays, holidays and awards. We've seen them and they are beautiful! Write to *Cairns & Brother, Inc.*, makers of world-famous Cairns firemen's helmets, at 854 Bloomfield Avenue, (Allwood) Clifton, New Jersey.

BUYING NEW EQUIPMENT?

Consider the products advertised in this issue.

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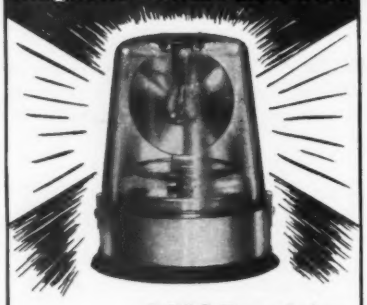

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Form 3547 Requested.

Something to do for '62!

Take a pen, now, and make a resolution for the coming year. It can go like this:

> RESOLVED: *That the officers and men in my fire department, for their own safety, will have access to the latest and best information available on fire protection, fire prevention, and fire control;*
>
> *That they will be assured of such information by receiving the publications which will come to the fire department through membership in the National Fire Protection Association;*
>
> *That the information supplied by those publications will be discussed by the officers and men and incorporated, when possible, in the fire department training and operations;*
>
> *That application for NFPA membership will be made before the last week in November of this year, specifying that membership is to begin on January 1, 1962.*

After you write this resolution, do something about it! It is not too early to plan how to make maximum use of NFPA membership for 1962. Find out how many officers and men would like to receive FIREMEN magazine each month. Add the cost of these subscriptions ($2.00 each) to the membership dues (see box at right). Type the list of names and addresses, fill out the application blank below, and send the list and blank to the NFPA.

The sooner you act on this, the better! Three quarters of the year 1961 is already history and the next year is approaching fast! It may be the most important, action-filled year your fire department will ever experience. Make sure that your officers and men are well informed concerning the massive problems created by fire.

Their lives may depend on what they can learn in 1962!

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60 Batterymarch Street, Boston 10, Massachusetts

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The fire department named below applies for NFPA membership. The names and addresses of men who are to receive FIREMEN magazine are attached.

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Address.....

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